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ABSTRACT

A program for underachieving elementary school students with perceptual deficits was designed to integrate perceptual training into a "pullout" remedial program for non-public schools in Allegheny County, Pennsylvania (exclusive of the City of Pittsburgh). One-hundred children in grades two through eight and 10 remedial teachers participated in the program. Teachers received training in the identification and treatment of perceptually impaired children in a series of six workshops presented by a learning disabilities supervisor and a remedial supervisor. Children's learning modality and perception deficits were identified through testing. Treatment consisted of teaching reading or arithmetic through the child's stronger modality, either visual or auditory, and through remediating the perceptual problems which were prerequisite to acquisition of skills. Children received treatment-related instruction for two periods per week throughout the school year. A modified expected achievement level as an outcome of instruction was predicted for each child. Program evaluation results revealed that every child improved his or her performance on perceptual tasks, but 16 percent did not reach the level of error-free behavior predicted. Absence of a control group prohibits conclusions about the impact of perceptual training on arithmetic or reading achievement. Included in the six appendices that make up approximately half the document are (1) materials related to the design of the study; (2) perception, reading and mathematics objectives at primary and intermediate levels as well as sample individualized instructional programs (IIPs); (3) inservice teacher training workshop materials; and (4) a teacher guide to implementing perceptual training into the remedial program. (Author/PH)

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A PROGRAM THAT INTEGRATES PERCEPTUAL TRAINING
WITH READING AND ARITHMETIC

by

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Submitted in partial fulfillment of the requirements for
the degree of Doctor of Education, Nova University

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FOREWORD

Should the treatment of perceptual deficits be included in remedial reading and remedial math programs? If included how can perceptual training be given without using a disproportionate amount of the time allocated for remedial service? Does the time devoted to perceptual training pay off in better perceptual skills, in improved performance in reading and arithmetic, in improvement in both areas, or in improvement in neither area? These are a few of the questions which were asked by the remedial teachers and the supervisor of remedial services before this project was initiated. How they were answered is seen in the outcome of the project.

The integration of perceptual training with remedial reading and arithmetic instruction arose from the non-public schools principals' requests for perceptual training for remedial students and from the remedial teachers' need to be able to identify and ameliorate the students' perceptual deficits that appeared to be prerequisites to fundamental reading and math skills. This report describes how needs were identified, why perceptual training was included in the program, the objectives of the project, how the project was developed, field tested and implemented, and how it was evaluated.

Most educators are aware of Title I remedial programs which are provided with Federal funds and implemented at the local level. Lesser

known are the services to non-public schools provided by Pennsylvania Act 89 known as the Non-Public Schools Auxiliary Services Act. The state funds and the auxiliary services are administered by the Allegheny Intermediate Unit which functions at a level somewhere between that of the state and that of the local school district. Thus the report begins with the description of the intermediate unit, the role of a remedial supervisor in the Non-Public Schools Program, and a brief summary of the remedial reading and math programs which were providing service to the children in the non-public schools.

CHAPTER I

INTRODUCTION

The Allegheny Intermediate Unit (AIU) is an educational agency that provides a variety of services to the 46 school districts in Allegheny County exclusive of the City of Pittsburgh. The intermediate unit is the middle level of the three-tiered school organization in Pennsylvania--State Department of Education, intermediate units, and local school districts. Through the intermediate units, local school districts have access to programs and services which can be provided more economically and effectively on a regional basis. Among the programs provided by Pennsylvania's 29 intermediate units is the Non-Public Schools Program (NPSP) made possible by Pennsylvania Act 89 of 1975. The AIU administers Act 89 auxiliary services to eligible non-public schools located in the 46 Allegheny County School districts.

As of August 30, 1978, the supervisor of remedial services in the AIU was responsible for remedial reading and arithmetic instruction delivered by 28 teachers to 53 non-public schools. The supervisor observed and evaluated the teachers, provided in-service training, directed program-development, reviewed and purchased materials (\$20,000 materials budget), interviewed and recommended candidates for hiring, and gave one-fifth of her time to planning and providing in-service workshops for the public schools through the Instructional

Support Services Program which is another major division of the AIU.

The remedial program for 1978-1979 provided individualized reading or arithmetic instruction for 1802 children in grades two through twelve who were achieving below grade level. The Summary Report on Classes in appendix 1 shows the number of children at each grade level. Below grade level achievement was defined as six or more months for primary children, one or more years for grades four through six, and one and one-half or more years for grades seven through twelve. Children who were working at grade level but were achieving below their own potential were not admitted to the program. Standardized test scores, classroom performance, and the classroom teachers' recommendations were used to identify candidates for remedial instruction. Once students had been recommended for the program, additional diagnostic data was gathered from school records and from tests administered by the AIU teachers.

The AIU teachers administered reading and arithmetic achievement tests to determine each student's level of entry at the beginning of the program and again at the end of the program to assess progress. Criterion-referenced mastery tests were used to identify specific instructional objectives for each student. Each teacher wrote an individualized instructional program (IIP) for each child based on the data obtained from the various assessment instruments and data from the student's file. A sample IIP is in appendix 1.

Each elementary student's program of instruction was received with the classroom teacher and the school principal before the program

of instruction was begun. The classroom teacher or the principal signed the IIP to show that he or she had seen it. The parents of each student received a copy of the IIP at one of the two parent conferences or by mail. The IIP differed from the IEP mandated by P.L. 94-142 in that the IIP had no legal ramifications.

CHAPTER II

PROBLEMS AND NEEDS IN ACHIEVEMENT AND PERCEPTION

Principals Ask for Perception

The problem of including perceptual training in the remedial program emerged when several principals in the non-public schools asked the AIU teachers to include perception objectives in the IIP. According to the principals, diagnoses and recommendations for the treatment of perceptual deficits had already been made by school psychologists, the Association for Children with Learning Disabilities (ACLD), Vision Institute, Children's Hospital, West Penn Hospital's Department of Learning and Communication Disorders, and several optometrists. Evidence of the students' perceptual needs were already in their permanent record files. The principals expected the remedial teachers to include perceptual training in their remedial instruction. Perceptual training had not been included in the remedial program because prior administrators believed that treating perception deficits would encroach upon the time needed for teaching reading and arithmetic skills.

Teachers Ask for Training

The AIU teachers were uncertain about their ability to treat perceptual deficits. At an end-of-the-year evaluation session in June 1978, the teachers discussed the lack of perceptual training as a deficiency in the instructional program. They asked for an in-service

training program which would prepare them to identify and treat perceptual problems. A brief questionnaire developed by the program supervisor indicated the extent of the teachers' uncertainty and needs in the area of perception. Administered in August 1978, the questionnaire showed that only two of the teachers surveyed had the skills needed to treat students' perception problems. While over half of the staff had had some training in the areas of visual and auditory perception, only two felt competent enough to work with the students. The questionnaire, Survey of Needs, and the teachers' responses are on the next page in figure 1.

Tests Show Below-Grade Achievement

Among the 2200 students referred for remedial service for the 1978-1979 school year were 1776 referrals in grades 2 through 8. The students had been referred for remedial instruction on the basis of low scores on their classroom achievement tests and poor classroom performance. The screening tests (norm-referenced pretests) administered by the AIU teachers identified 773 arithmetic referrals and 688 reading referrals or a total of 1461 children who qualified for remedial instruction on the basis of below-grade level performance. Below-grade level was defined as one-half year or more for grades 2 and 3, one year or more for grades 4 through 6, and one and one-half years or more for grades 7 through 12. Table 1 shows the range of pretest scores per grade in reading and arithmetic.

Perceptual Screening Reveals Many Deficits

Among the children who were accepted for remedial instruction were 67 who had been identified as perceptually impaired by outside agencies some time during their school careers. In addition, there were 52 children who were suspected of having perceptual deficits. All were administered

SURVEY OF NEEDS

Please respond by circling yes or no for items one through four. Write in the spaces provided for items five and six.

- | | | |
|--|------------------------|----------|
| 1. Have you had training in the identification of perceptual problems in children? | YES
17 | NO
10 |
| 2. Have you had training in the treatment of problems in: | | |
| visual perception? | YES
15 | NO
12 |
| auditory perception? | YES
16 | NO
11 |
| 3. Do you feel the need for training in the identification and treatment of perceptual problems in children? | YES
25 | NO
2 |
| 4. Do you have enough experience in the identification and treatment of children with perception problems to be able to serve as a trainer of teachers in our own program? | YES
2 | NO
25 |
| 5. List the perception tests with which you have had some experience. Mark a star after those that you have administered repeatedly--at least five administrations. While exact names of tests are not required, please give enough of the title to make identification of the test possible. | | |
| | Number of Times Listed | |
| Frostig Test of Visual Perception | 2 | |
| Wepman Auditory Discrimination Test | 9 | |
| Harris Test of Lateral Dominance | 1 | |
| Slingerland Screening Tests | 2 | |
| 6. Comments: Teachers' comments included two statements about not wanting to teach walking a balance beam or skipping. Otherwise, all statements were positive. Twenty teachers said they needed to be reacquainted with the perception tests and/or with the language of perception. Two teachers said they were willing to explore additional areas of perception. | | |

Figure 1. Summary of remedial teachers' responses to survey about their ability to provide perceptual training for students.

TABLE 1

RANGE OF PRETEST SCORES PER GRADE

<u>Reading</u>		<u>Arithmetic</u>	
Grade 2	1.0 - 1.5	Grade 2	1.0 - 1.5
3	1.0 - 2.3	3	1.0 - 2.5
4	1.0 - 3.0	4	1.7 - 3.7
5	1.7 - 3.9	5	2.8 - 4.1
6	2.1 - 4.2	6	3.7 - 5.4
7	2.1 - 4.9	7	2.7 - 3.1
8	2.1 - 6.3	8	3.7 - 5.3

the Slingerland Screening Tests.¹ Of the 119 children tested, a total of 113 had scores that indicated significant perceptual problems. The magnitude of the problem was recognized when it was realized that 113 students represented 7 percent of the remedial population (grades 2-8) and not all of the children had been evaluated for perceptual problems. The Slingerland Screening Tests yield error scores. An error score of 15 or more indicates deficiencies in perceptual skills. Table 2 shows the range of error scores that were obtained by the students in this project.

TABLE 2

RANGE OF PERCEPTION ERROR SCORES PER GRADE

<u>Reading</u>		<u>Arithmetic</u>	
Grade 2	24-56	Grade 2	35-40
3	28-56	3	37-58
4	39-59	4	29-57
5	20-67	5	29-47
6	29-54	6	36-42
7	35-49	7	39-42
8	29-45	8	32-52

¹Beth H. Slingerland, Slingerland Screening Tests for Identifying Children with Specific Language Disability (Cambridge, Massachusetts: Educators Publishing Service, Inc., 1974).

In addition to low achievement and perceptual deficits, the children demonstrated discrepancies between achievement and learning potential when achievement scores were compared with expectancies. The terms learning potential, learning capacity, and expectancy are used interchangeably in the literature of remediation. The term expectancy* in this document refers to the student's potential or capacity for learning. It is not to be construed as a goal of instruction nor as a floor or ceiling of achievement. The expectancy is simply the translation of the IQ score into a grade equivalent against which the child's achievement score can be judged in order to ascertain the extent of his reading disability.

The prevailing method of assessing reading or arithmetic disability is to compare the child's grade equivalent achievement score (from a standardized test) with his expectancy (which is derived from his IQ score). The achievement score should be higher than the expectancy. If the achievement score is lower than the child's expectancy, the student is not learning according to his potential. The greater the discrepancy between expectancy and achievement, the greater the disability.

The data showed discrepancies between expectancy and achievement which increased with each higher grade level. Second graders in the reading program had discrepancies that ranged from .5 year to 1.1 years. The discrepancies between expectancy and achievement for eighth graders ranged from 1.3 years to 6.9 years. Discrepancies in arithmetic ranged from 1.0

* Expectancy is determined according to the formulae on pages 9-11 and is used to identify the disparity between potential and achievement. A modified expectancy which is called the modified expected achievement level (MEA level) has been developed to permit the consideration of additional variables with respect to predicted achievement. The MEA level is explained on pages 23-28.

to 2.2 years at the primary level (grades 2-3) and from .6 to 4.3 years at the upper elementary level (grades 4-8). Table 3 shows the range of discrepancy between expectancy and achievement for reading and arithmetic students per grade.

TABLE 3
RANGE OF DISCREPANCIES BETWEEN
EXPECTANCY AND ACHIEVEMENT

<u>Reading</u>		<u>Arithmetic</u>	
Grade 2	.5 - 1.1 years	Grade 2	1.1 - 1.2 years
3	.6 - 2.3	3	1.0 - 2.2
4	.6 - 2.7	4	.7 - 1.9
5	1.1 - 2.6	5	.6 - 2.2
6	1.2 - 3.8	6	1.3 - 4.3
7	1.7 - 3.3	7	2.3 - 3.8
8	1.3 - 6.9	8	1.3 - 3.9

Formulae for Computing Expectancies

The Bond-Tinker formula was used for computing reading expectancies.² A reading expectancy is found by multiplying the child's IQ (divided by 100) by the number of school years completed and adding 1.0 because the child is at the 1.0 level when he enters school. The formula for computing a reading expectancy is:

$$RE = \frac{IQ}{100} \times \text{years completed} + 1.0$$

A child who has just completed three years of school and has an IQ of 100 has a reading expectancy of 4.0.

$$RE = \frac{100}{100} \times 3 \text{ years} + 1.0 = 4.0$$

²Guy L. Bond and Miles A. Tinker, Reading Difficulties: Their Diagnosis and Correction, Second Edition (New York: Appleton-Century-Crofts 1977), p. 92.

The Horn formulae were used for computing math expectancies for the children in the remedial arithmetic program.³ There are four formulae in all. The user selects the formula that matches the child's chronological age. The Horn math expectancy is found by computing the average of a combination of mental and chronological ages expressed as months. The result is an age expectancy. We subtract 6 years because most children begin school at age six; 1 year is added because the child is at the 1.0 level when he enters the first grade. The Horn formulae are shown below:

$$\begin{array}{lll} \text{For ages} & & \\ 6-0 \text{ to } 8-5 & \text{ME} = \frac{\text{MA} + \text{CA in months}}{2} & -6 \text{ years} + 1.0 \text{ year} \end{array}$$

$$\begin{array}{lll} \text{For ages} & & \\ 8-6 \text{ to } 9-11 & \text{ME} = \frac{3\text{MA} + 2\text{CA in months}}{5} & -6 \text{ years} + 1.0 \text{ year} \end{array}$$

$$\begin{array}{lll} \text{For ages} & & \\ 10-0 \text{ to } 11-11 & \text{ME} = \frac{2\text{MA} + \text{CA in months}}{3} & -6 \text{ years} + 1.0 \text{ year} \end{array}$$

$$\begin{array}{lll} \text{For ages} & & \\ 12-0 \text{ and} & \text{ME} = \frac{2\text{MA} + \text{CA in months}}{4} & -6 \text{ years} + 1.0 \text{ year} \\ \text{above} & & \end{array}$$

A child aged 10 years and 6 months with a mental age of ten years has a math expectancy of 5.2. The formula that matches his chronological age was used to compute the math expectancy.

$$\text{ME} = \frac{2\text{MA} + \text{CA in months}}{3} - 6 \text{ years} + 1.0$$

$$\text{ME} = \frac{366 \text{ months}}{3} - 6 \text{ years} + 1.0$$

$$\text{ME} = 10 \text{ yr. } 2 \text{ mo.} - 6 \text{ years} + 1.0$$

$$\text{ME} = 5.2$$

Mental and chronological ages have a twelve month base. A school year

³Fredericka K. Reisman, A Guide to the Diagnostic Teaching of Arithmetic (Columbus, Ohio: Charles E. Merrill Publishing Company, 1972), pp. 87-88.

is computed as ten months. The following guide will help the user to convert to math expectancies those age expectancies that end with 10 or 11 months.

Age expectancy	13 years, 8 months	= ME 8.8
	13 years, 9 months	= ME 8.9
	13 years, 10 months	= ME 9.0
	13 years, 11 months	= ME 9.0
	14 years, no months	= ME 9.0
	14 years, 1 month	= ME 9.1

Discrepancy or Tolerable Difference?

How large a discrepancy must be to be considered a serious deficit depends upon the age or grade of the child. Wilson's Table of Degree of Tolerable Difference Between Potential and Achievement was used to distinguish a "tolerable difference" from a reading disability.⁴ According to Wilson, tolerable differences become serious discrepancies when they reach the following proportions:

.5 year	for grades 1-3
1.0 year	for grades 4-6
1.5 years	for grades 7-9
2.0 years	for grades 10-12

The table is widely used in the field of reading as a guide for identifying the disabled reader and is shown in its entirety as table 4 on the next page. The table was adopted as a guide for judging tolerable differences and discrepancies in the math program.

Reading and math expectancies are computed in order to establish the need for remediation. By comparing the expectancy with achievement, the diagnostician can evaluate the extent of the child's disability in reading or arithmetic. The reading and math expectancies computed with the Bond-Tinker and Horn formulae are not goals of instruction. They are determinants of need.

⁴Robert M. Wilson, Diagnosis and Remedial Reading for Classroom and Clinic (Columbus, Ohio: Charles E. Merrill Publishing Co., 1972), p. 53.

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TABLE 4

DEGREE OF TOLERABLE DIFFERENCE⁵ BETWEEN
POTENTIAL AND ACHIEVEMENT

End of:		
1st grade	.3	
2nd grade	.5	.5 of a year
3rd grade	.7	
4th grade	.8	
5th grade	1.0	1.0 year
6th grade	1.2	
7th grade	1.3	
8th grade	1.5	1.5 years
9th grade	1.7	
10th grade	1.8	
11th grade	2.0	2.0 years
12th grade	2.2	

Tolerable difference ranges must be used as judgment points,
not as absolutes.

Summary of Needs Data

The extent of the students' needs was evident. Achievement scores were at least one-half year below grade level for students in grades 2 and 3, one year or more for students in grades 4 through 6, and more than two years for students in grades 7 and 8. All perception error scores were far above 15, the level at which perception errors indicate significant perceptual problems. Discrepancies exceeded the range of tolerable difference between expectancy and achievement at all grade levels. Table 5 represents a summary of the students' achievement scores, their perception scores, and the discrepancies between achievement and expectancy. The data is shown by grade.

⁵ Ibid.

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TABLE 5

SUMMARY OF STUDENTS' ACHIEVEMENT, PERCEPTION,
AND DISCREPANCY SCORES BY GRADE LEVEL

Grade Level 1978-1979	Number of School Years Completed	Range of Achievement Scores	Range of Perception Errors	Range of Discrepancy Scores	Number of Students n=100
<u>Reading</u>					
2	1	1.0-1.5	24-56	.5-1.1	14
3	2	1.0-2.3	28-56	.6-2.3	10
4	3	1.0-3.0	39-59	.6-2.7	9
5	4	1.7-3.9	20-67	1.1-2.6	15
6	5	2.1-4.2	27-54	1.2-3.8	5
7	6	2.1-4.9	35-49	1.5-3.3	4
8	7	2.1-6.3	29-45	1.3-6.9	4 61
<u>Arithmetic</u>					
2	1	1.0-1.5	35-40	1.1-1.2	2
3	2	1.0-2.5	37-58	1.0-2.2	8
4	3	1.7-3.7	29-57	.7-1.9	10
5	4	2.8-4.1	29-47	.6-2.2	8
6	5	3.7-5.4	36-42	1.3-4.3	5
7	6	2.7-3.1	39-42	2.3-3.8	2
8	7	3.7-5.3	32-52	3.7-5.3	4 39

In short, achievement in reading and arithmetic was not only below grade level but was low in terms of each student's potential. Problems in perception were numerous among the students who had been identified as having perceptual deficits. Teachers were uncertain as to how to treat perception problems without depriving students of instruction in the areas of reading and arithmetic.

All of the data summarized in the tables in this chapter were taken from the individual pupil data displayed for each student in table 6 on pages 31-39.

CHAPTER III

MEASURES USED IN THE PROJECT

Reading and Arithmetic Assessment

Children were given the achievement pretest in September 1978 and the posttest in May 1979. The Primary I and II Tests and the Short Form Tests from the SRA Assessment Survey Achievement Series were used because the tests are normed for out-of-grade testing, require only 25 or 30 minutes to administered, and are easy to score. Reliabilities for the various tests range from .79 to .87. The following tests were used:

Primary I Reading, Forms E and F for grades 2 and 3

Primary II Reading, Forms E and F for grades 3 and 4

Primary I Mathematics, Forms E and F for grades 2 and 3

Primary II Mathematics, Forms E and F for grades 3 and 4

NRT Math and Reading, Blue Level for grades 4 and 5

NRT Math and Reading, Green Level for Grades 5 and 6

NRT Math and Reading, Red Level for grades 6 through 8

Alternative forms of the primary tests were used for the posttest. The same form of the Blue, Green, and Red levels were used for the posttest because the alternate forms were not yet available from the publisher.

Tests from the SRA Criterion-Referenced Measurement Program were used as diagnostic instruments to identify instructional needs. Mastery SCBAR Reading, Form L and Mastery Mathematics, Form X were administered to each

student according to his achievement entry level. Children who scored at the first grade level were given the Level A Mastery test. Those who scored at the second grade level were given the Level B Mastery Test and so on.

Perception and Modality Assessment

The Slingerland Screening Tests for Identifying Children with Specific Language Disability were used to identify the perceptual deficits and the modality of each child. This test was chosen for perceptual evaluation for the following reasons:⁶

1. The tests sample the perceptual skills required in the classroom--tasks of copying from a far point, copying from nearpoint, reading, writing, taking dictation, and writing numerals.
2. The screening tests are recognized and used as one of the major instruments for assessing perceptual strengths by other diagnostic-prescriptive programs including:
 - a. The Association for Children with Learning Disabilities
 - b. The Exceptional Children's Program, AIU
 - c. West Penn Hospital, Department of Learning and Communication Disorders.
3. The tests can be administered by the reading specialists or arithmetic teachers after a few hours of training and a practice session with a group of other teachers or non-impaired children.

The Slingerland Screening Tests, Forms A, B, C, and D were used to establish entry levels and were administered near the end of the program to evaluate growth. The tests show the relative strengths or weaknesses that may exist in visual, auditory, kinesthetic functioning and are the same

⁶The Slingerland Screening Tests are listed in Reading Tests and Reviews, edited by Oscar Krisen Buros, (Highland Park, New Jersey: The Gryphon Press 1968), p. 162. No evaluation of the tests is given.

for all grades. The levels differ from each other only in vocabulary difficulty. The first five subtests require responses to visual stimuli. Tests six through eight require responses to auditory stimuli.

Four forms or levels of the test were used:

Form A for grade 1

Form B for grades 2 and 3

Form C for grades 3 and 4

Form D for grades 5 through 8

The subtests at each level yielded error scores. A total error score which exceeded 15 indicated the existence of perceptual difficulties. A reduction in error score on the posttest indicated improved performance on perceptual tasks. The quick analysis form (shown on page 2 of each test booklet) was used to analyze each student's performance.

Sources of Intelligence Test Scores

IQ scores were needed for calculating reading and math expectancies (to establish needs) and for predicting achievement outcomes (to set goals). Scores from two tests were used; the individually administered Wechsler Intelligence Scale for Children (WISC) and the group administered machine-scored California Short Form Test of Academic Achievement (SFTAA). All test scores were less than one year old. The SFTAA had been administered in October 1977. The WISC scores came from the individual educational evaluations done by school psychologists between October 1977 and September 1978.

Description of IQ Tests

The WISC is an individual IQ test which is usually administered by a school psychologist to children aged 5 years to 15 years 11 months. The test yields three types of scores: Full Scale IQ, Verbal and Performance IQs, and the scaled subtest scores. The Verbal Scale subtests involve auditory verbal input and vocal verbal output. The examiner reads aloud the questions on all subtests; the student responds orally. The Performance Scale involves visual, nonverbal input and motor, nonverbal output.

The Full Scale IQ is the average of the Verbal and Performance Scale IQs. It is of little value to the diagnostician. More important is the magnitude of the difference between the Verbal and Performance Scale IQs. A difference of 15 or more points may indicate deficiencies in processing information, in modes of expression, in perception, or in working under pressure, all of which may be involved in a reading or math disability. The subtest scaled scores yield specific diagnostic information about the child's performance. This information is less subject to distortion by errors of measurement, conditions during test administration, or test construction.

The SFTAA provides an index of general academic aptitude from grades 1.5 through 12. The four subtests--Vocabulary, Analogies, Sequences, and Memory--are combined to yield separate measures of a Language IQ and a Non-language IQ as well as a Total IQ. A machine-scored group test, the SFTAA is administered throughout the Pittsburgh Diocese in conjunction with CTB/McGraw-Hill's California Achievement Tests.

Caution Advised in Using IQ Scores

The WISC and the SFTAA each yield a Full Scale IQ, a Verbal IQ, and a Performance IQ. The Full Scale IQ is the average of the Verbal and Performance IQs and is the least useful in diagnosis. Searls, in How to Use WISC Scores in Reading Diagnosis, outlines procedures for using IQ scores. When discussing the use of the Verbal IQ and the Performance IQ in diagnosis she says, "...assume that the higher scale is more representative of the student's true level of functioning."⁷ Thus, the higher of the two scores was used for calculating the reading expectancy or math expectancy for each child.

Care must be taken not to over-emphasize the use of the IQ score in the diagnostic/prescriptive process. An IQ score, no matter how carefully obtained, is an imperfect measure of only a small part of what constitutes human intelligence. At best, an IQ score is only an approximation of the student's true IQ and reflects a considerable margin of error or chance score.

The margin of error in a standardized test score is known as the standard error of measurement.⁸ The standard error of measurement for the WISC and the SFTAA have been computed and are reported for various age levels. It gives the user of the test scores some idea of the accuracy (or inaccuracy) of the IQ score. For example, the standard error of measurement for the WISC Verbal IQ at age 10.5 years is 3.00.⁹ For a ten year old

⁷ Evelyn F. Searls, How to Use WISC Scores in Reading Diagnosis, (Newark, Delaware: International Reading Association, 1975), p. 39.

⁸Searls, p. 6.

⁹Searls, p. 7.

child with an IQ of 105, chances are two out of three that his true IQ lies somewhere between one standard error of measurement below and one standard error of measurement above 105--somewhere between 102 and 108.

$$\begin{array}{r} 105 \\ - 3.00 \\ \hline 102 \end{array}$$

$$\begin{array}{r} 105 \\ + 3.00 \\ \hline 108 \end{array}$$

To be more certain of the range within which the true score lies, we add and subtract two standard errors of measurement ($2 \times 3.00 = 6.00$).

$$\begin{array}{r} 105 \\ - 6.00 \\ \hline 99 \end{array}$$

$$\begin{array}{r} 105 \\ + 6.00 \\ \hline 111 \end{array}$$

Then chances are 95 in 100 that the true Verbal IQ lies between 99 and 111, a range of 12 points. On a group test such as the SFTAA, the standard error of measurement is greater and the range of scores within which the true score lies is even broader than on an individual test.

When using an IQ score for diagnosis, prescription, or prediction, several points should be borne in mind:

1. The IQ score is at best only an approximation of the true IQ of the individual. It represents a point within a band or range of scores which may include 12 or more points.
2. Situational variables such as the physical setting, the examiner's rapport with the child, and the child's health may have affected the test score.
3. The standardized IQ score compares the student to a norm group which may have very different characteristics than the person being tested. The WISC, for example, was standardized with a group of children who were white, middle-class youngsters living in the 1940s. Minorities were not included in the sample. The extent to which a student differs from the norming population may bias his test score.
4. An IQ score alone does not give any clues as to why the student is having difficulty with reading or arithmetic.

Other Factors That Influence Learning

Intelligence was not the only factor taken into account when predicting instructional outcomes for low achieving pupils. Children have learning problems for many reasons. Causal factors such as genetics or inheritance predispose a child to learning difficulties. Other biological events which may influence a child's ability to learn are birth trauma, infectious disease, malnutrition, and congenital defects.¹⁰ "Maturational lag" is a factor in learning according to Satz and his colleagues. They have advanced a theory that learning disorders result from a lag in the development of dominance in the left hemisphere of the brain--that portion of the brain which subserves the functions of reading, language, and speech development.¹¹

Socio-cultural factors shape a child's learning. Family relationships, social class, membership in a subcultural group, racial discrimination, bilingualism, peer relationships, parents' education, and even the media influence the child's behavior in school.

Educational factors which influence learning include the amount of instruction, quality of instruction, learning climate, teacher expectation, school attendance, and chances for success. All of the intellectual, biological, socio-cultural, and educational factors have an impact on how and what a child learns.

¹⁰Johnson and Myklebust, p. 264.

¹¹Paul Satz, D. Rardin, and J. Ross, "An Evaluation of the Theory of Specific Development Dyslexia," Child Development 42 (1971), p. 2019.

CHAPTER IV

TERMINAL PERFORMANCE OBJECTIVES

General Objective

The general objective of the program was to improve reading and arithmetic achievement through teaching strategies that took into account the student's strengths and weaknesses in auditory and visual perception. The teachers would teach to the stronger modality and remediate the weaker area of perception with appropriate reading and arithmetic materials. An intensive in-service training program would prepare teachers to deal with the perceptual component of instruction.

Target Population

The target population consisted of one hundred children in grades 2 through 8 in non-public schools. All students were (1) below grade level in either reading or arithmetic, (2) had discrepancies of from .5 to 6.9 years between achievement and expectancy, and (3) had demonstrated deficits in one or more areas of perception. The students are identified by student number in table 6 on pages 31-39. They are arranged according to the number of years of school completed as of September 1978 (column 4). Students R1 through R61 were in the remedial reading program. Students M62 through M100 were in the remedial arithmetic (math) program. An individual instructional program was written for each child. Teachers computed a terminal achievement level for each student.

Using Test Scores to Predict
Instructional Outcomes

Given a student's IQ and his pretest score, the diagnostician should be able to predict a minimum achievement level or posttest score as an outcome of instruction. The minimum achievement level can be found by combining the child's entry level score expressed as a grade equivalent with his IQ which has been converted to an achievement index.

The rationale for converting the IQ to an index of achievement is found in the Bond and Tinker reading expectancy formula¹² and in Dechant's reference to the IQ as a rate of mental development. Bond and Tinker say that a child with an IQ of 150 can be expected to learn new things about one and one-half times as fast as the average child.¹³ Likewise, a child with an IQ of 75 can be expected to learn three-fourths as fast as the average child. A child with an IQ of 100 is expected to gain one year of achievement for each year of instruction. Dechant maintains that the IQ refers to the rate of mental development.¹⁴ According to him, an IQ of 120 means that the person has advanced at a rate of 1.2 years mentally for each year of chronological life (up to age fifteen or sixteen). An IQ of 80 means that he has advanced 0.8 of a year mentally for each year of chronological life. If a child with an IQ of 100 is expected to gain one year of achievement for each year of instruction, we can convert an IQ score to an achievement index by dividing it by 100.

$$\text{Achievement Index} = \frac{\text{IQ}}{100}$$

¹² RE = 100 x years completed + 1.0

¹³ Bond and Tinker, p. 92.

¹⁴ Emerald Dechant, Diagnosis and Remediation of Reading Disability, (West Nyack, N. Y.:Parker Publishing Company, Inc. 1968), p. 67.

By adding the achievement index to the pretest score, the teacher can predict a minimum posttest achievement level for a given child. For example, if a child has an IQ of 120 and a pretest GE of 3.2, he can be expected to attain a level of at least 4.4 on the posttest.

Expected Achievement = Pretest GE + Achievement Index

$$EA = 3.2 + \frac{120}{100} = 4.4$$

The Modified Expected Achievement Level

Given the student's pretest score and IQ, the teacher can calculate a minimum posttest level assuming the child demonstrates normal learning behavior. The children in this project, however, had demonstrated perceptual deficits and were not progressing normally. All were achieving below grade level and below their own levels of potential. Calculations had to be modified to take into account the factors that interfere with learning. A few children, while demonstrating perceptual deficits, appeared to have positive factors such as high drive, extra periods of instruction, or extensive vocabulary operating in their favor. Positive as well as negative factors were included in the formula for finding the modified expected achievement (MEA) level. A value of .1 was assigned to each positive or negative factor that might have an effect on the child's learning. The following MEA level formula emerged:

$$\text{MEA Level} = \text{Pretest GE} + \frac{\text{IQ}}{100} \pm .1 \text{ for each factor}$$

Assume that the child with the 3.2 pretest GE and the 120 IQ also had a perception problem. His expected achievement level would have to be modified to take that deficit into account. We deduct .1 for perception

which, as an impediment to learning, is entered into the formula as a negative number.

$$\text{MEA Level} = \text{Pretest GE} + \frac{\text{IQ}}{100} - \text{perception}$$

$$\text{MEA} = 3.2 + 1.2 - .1 = 4.3$$

Why use .1 as the value for the factors that affect learning? Other values were tried. The values of .05 and .2 when applied to a sample of one hundred students with learning problems appeared to be too extreme. The value of .05 did not sufficiently modify the expected achievement level. The value of .2, on the other hand, depressed the expected achievement too far, particularly for students who demonstrated three or more problem behaviors.

What does the value of .1 represent? There are two ways of looking at it. It can represent one month of achievement, or it can represent ten points off the IQ score. Using the same hypothetical child with the pretest score of 3.2 and an IQ of 120, we can try the formula both ways to see just what .1 represents in the computation:

$$(.1 \text{ as 1 month of achievement}) \quad \text{MEA} = (3.2 - .1) + 1.2 = 4.3$$

$$(.1 \text{ as 10 months off the IQ}) \quad \text{MEA} = 3.2 + \frac{(120 - 10)}{100} = 4.3$$

An impediment to learning or negative factor has the effect of depressing the achievement level by 1 month or the IQ score by 10 points. A positive factor has the effect of raising the achievement level by 1 month or the IQ score by 10 points.

Two IQ Tests: Two MEA Formulae

The students' most recent IQ scores were used in the MEA level computations. All students had been given the group administered SFTAA (California Short Form Test of Academic Aptitude). About one-third of the children had had individual evaluations with the WISC. The MEA formula had to be adjusted to accomodate the scores from the two IQ tests. The result was a pair of MEA formulae which were based on the following assumptions:

1. Perception problems which impede achievement also impede performance on a group administered IQ test. The effect of the perception problem is reflected in a depressed IQ score yielded by the SFTAA.
2. Perception problems, while identified during the individually administered WISC, do not greatly affect the resulting IQ score.

The basic formula for finding the MEA level was:

$$\text{MEA Level} = \text{Pretest GE} + \frac{\text{IQ}}{100} \pm \text{Other Factors}$$

When the SFTAA IQ was used, perception was not counted as a factor because its effect was reflected in the group IQ score. When the WISC IQ was used in the formula, perception was entered in the formula as a negative factor. The formulae for finding the MEQ levels were:

$$\text{MEA} = \text{Pretest GE} + \frac{\text{SFTAA IQ}}{100} \pm .1 \text{ for each factor but } \underline{\text{not}} \text{ perception}$$

$$\text{MEA} = \text{Pretest GE} + \frac{\text{WISC IQ}}{100} \pm .1 \text{ for each factor } \underline{\text{and}} \text{ perception}$$

The MEA level was modified by subtracting one month of achievement for each negative factor identified for the child. Perception problems counted for one month only regardless of the number of perceptual deficits identified by the Slingerland Screening Tests. Some problems were grouped because of

their similarity. The identification of one or more problems in any group counted as only one month in calculating the MEA level. In addition to perception, the following factors which impede learning were identified:

1. Immature behavior or insecurity
2. Short attention span or distractability
3. Hyperactivity
4. Poor self-motivation
5. Poor self-image, defeatist attitude, or low confidence
6. Social-emotional problems including hostility, home problems, or peer problems
7. Disruptive behavior
8. Poor motor ability or poor handwriting
9. Illness or physical disability
10. Poor language ability, speech therapy, or bilingualism
11. Recommendation for LD placement
12. Instruction less than two periods per week
13. Poor school attendance

Reversals, twisted words, and disorganization were part of the perception syndrome and were not counted as additional factors.

Positive factors facilitate achievement. The MEA level was modified by adding one month of expected achievement for each positive factor. While there are many factors that facilitate achievement in reading or arithmetic, only the following were identified among the children in this project.

1. High self-motivation
2. Instruction more than two periods per week
3. Excellent vocabulary

Several examples of MEA level calculations are taken from the pupil data sheets on pages 31-39. The MEA level is shown in column 17. The pretest score is in column 7. Other factors and their plus or minus values are in column 10.

The following examples illustrate the use of the two formulae for predicting MEA levels for students R1, R9, R19, and R61.

Student R1, with a WISC score of 107, pretested at the 1.0 level. With three factors which impede learning--perception problems, immaturity, and absence--his predicted MEA level is 1.8.

$$\begin{array}{rcl}
 \text{MEA} & = & \text{Pretest GE} + \frac{\text{IQ}}{100} - .3 \\
 \text{MEA} & = & 1.0 + 1.07 - .3 \\
 \text{MEA} & = & 1.8
 \end{array}
 \qquad
 \begin{array}{r}
 1.0 \\
 +1.07 \\
 \hline
 2.07 \\
 - .3 \\
 \hline
 1.77 \text{ or } 1.8
 \end{array}$$

Student R9, with a group SFTAA IQ score of 110, a pretest GE of 1.0, perception problems and eyeglasses has a predicted MEA level of 2.0. Notice that one month is not deducted for perception because of the assumption that the perception problems are already reflected in the IQ score.

$$\begin{array}{rcl}
 \text{MEA} & = & \text{Pretest GE} + \frac{\text{IQ}}{100} - .1 \\
 \text{MEA} & = & 1.0 + 1.10 - .1 \\
 \text{MEA} & = & 2.0
 \end{array}
 \qquad
 \begin{array}{r}
 1.0 \\
 +1.10 \\
 \hline
 2.10 \\
 - .1 \\
 \hline
 2.0
 \end{array}$$

Student R19 has a WISC score of 117, reversals which are really part of the perception syndrome, and receives instruction only one period per week. His predicted MEA level is 3.1. The MEA is modified by two months, one each for perception and for fewer periods of instruction (the formula is based on two periods of instruction).

$$\begin{array}{rcl}
 \text{MEA} & = & \text{Pretest GE} + \frac{\text{IQ}}{100} - .2 \\
 \text{MEA} & = & 2.1 + 1.17 - .2 \\
 \text{MEA} & = & 3.07 = 3.1
 \end{array}
 \qquad
 \begin{array}{r}
 2.1 \\
 +1.17 \\
 \hline
 3.27 \\
 - .2 \\
 \hline
 3.07 \text{ or } 3.1
 \end{array}$$

The predicted MEA level for student R61 is modified upward by two months, one for an excellent vocabulary and one for extra periods of instruction. With a pretest GE of 2.1 and an IQ score of 114 on the SFTAA, his predicted MEA level is 3.4.

$$\text{MEA} = \text{Pretest GE} + \frac{\text{IQ}}{100} + .2$$

$$\text{MEA} = 2.1 + 1.14 + .2$$

$$\text{MEA} = 3.44 = 3.4$$

$$\begin{array}{r} 2.1 \\ +1.14 \\ \hline 3.24 \\ +.2 \\ \hline 3.44 \text{ or } 3.4 \end{array}$$

KEY TO PUPIL DATA SHEETS

The following information is found in the eighteen columns of the pupil data in table 6.

Column

1. Student Number consists of an alphabet letter and an ordinal number by which each child is identified. The letter R refers to the reading program. M refers to the arithmetic (math) program.
2. Birthdate confirms the identification of the child. It was used to compute the chronological age used in the Horn formula. In the original data, the birthdate consisted of the day, month, and year. Only the month and year are shown in the table.
3. Sex identifies each child as male (M) or female (F).
4. School Years shows the number of school years the child had completed by September 1978. It does not count kindergarten. The number of years completed is one less than the child's grade level if the child has not repeated a grade. There were no repeaters in this group.
5. IQ scores were taken from two tests, the Wechsler Intelligence Scale for Children (WISC) and the California Short Form Test of Academic Aptitude (SFTA).
6. Expectancy refers to the student's potential for achievement in reading or arithmetic. It is the translation of an IQ score into a grade equivalent against which the child's achievement score can be judged in order to ascertain the extent of his reading or arithmetic disability. The Bond-Tinker formula was used for calculating the reading expectancies for students R-1 through R-61. Arithmetic expectancies were calculated with the Horn formulae which require different combinations of mental ages and chronological ages for different age groups. How expectancies were computed is explained on pages 9-11.
7. Pretest Score is the reading achievement or arithmetic achievement score taken from the test administered to the child at the beginning of the program. The score is shown as a grade equivalent.
8. Deficit refers to the difference or discrepancy between the child's expectancy and his achievement in reading or arithmetic. It was used to show the extent of the child's reading or arithmetic disability.
9. Modality refers to the stronger sensory input channel as determined by perceptual evaluation. A refers to stronger auditory input channels while V refers to stronger visual channels. N means that neither channel has been shown to be particularly stronger than the other.

10. Other Factors include the biological, socio-cultural, maturational and physical factors that affect learning. A few are positive. Most are negative. The plus or minus numerals in the upper right corner of each cell represent the number of months by which the predicted MEA level was modified due to other factors including perception for children who were tested with the WISC. Perception problems were reflected in the SFTAA score and were not entered in the MEA level calculations for students who have SFTAA IQ scores. The plus/minus numeral also includes deviations from the regular two periods of instruction upon which the MEA formula is based. Each factor was assigned a value of .1. Other factors and the computing of the MEA level is explained in detail in chapter 9.
11. Perception Score is the total error score obtained on the Slingerland Screening Tests. A total of 15 errors on subtests 3 to 8 is considered to be a significant warning of the possibility of perceptual deficits according to the author on pages vi-vii in the teacher's manual for the tests.
12. Perception Objectives contains the objective identification numbers taken from the list of perception objectives in appendix 2. The letters A and V refer to auditory and visual objectives.
13. Predicted Mastery shows that the student was expected to complete 100 percent of his perception objectives with 80 percent mastery at a level of difficulty that was appropriate for the child.
14. Predicted Posttest scores for perception are lower than the pretest scores in column 11. Teachers predicted a perception posttest score for each child. The prediction was based on the teacher's opinion of the child's ability to improve in perceptual skills.
15. Reading/Arithmetic Instructional Objectives shows the code numbers of terminal objectives that were written into each child's IIP. They were listed in order of increasing difficulty or complexity. Reading objectives are listed in appendix 3; arithmetic objectives are in appendix 4.
16. Predicted Mastery refers to the reading or arithmetic objectives which the child was expected to complete and the level of mastery at which he was expected to complete them. For example, student R-1 was expected to complete 60 percent of his reading objectives with 80 percent mastery. Student M-62 was expected to complete 80 percent of his arithmetic objectives with 80 percent mastery.
17. MEA Level is the modified expected achievement level which was predicted for each child. The MEA level calculation takes into account the the child's pretest score, IQ, perception problems, and other factors which facilitate or impede learning. It is the minimum achievement level which the child was expected to attain as an outcome of his individualized instructional program. The formulae for the MEA level are explained on pages 23-28.
18. Instructional Time shows the number of periods per week and the number of minutes per period that the child received instruction.

TABLE 6

PUPIL DATA SHEETS

PUPILS WITH PROBLEMS IN PERCEPTION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Deficit	Modality	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	MEA Level	Instr. Time
R-1	12/70	M	1	WISC 107	2.1	1.0	1.1	N	insecure immature absent often	-0.3 56	V-1, V-2 A-1, A-2 A-3	100%obj at 80% mastery	40	PB 6,9,25,46,51,52 PC 4; PD 3,4,8; PE 18,11	60% obj at 80% mastery	1.8	2 per 35min
R-2	3/71	F	1	SFTA 95	2.0	1.1	.9	N	daydreams clumsy absent often	-0.3 52	V-1, V-2 V-5, V-7	100%obj at 80% mastery	35	PB 6,10,11,20,25,37,45 PB 46,51,52,68 PE 3; PF 1	60% obj at 80% mastery	1.8	2 per 35min
R-3	5/71	M	1	WISC 91	1.9	1.0	.9	N	inattentive absent often	-0.3 39	V-2, V-6 A-1, V-7	100%obj at 80% mastery	25	PB 6,7,8,9,10,11,20 PB 35,37,45,46 PB 51,52,68	60% obj at 80% mastery	1.6	2 per 35min
R-4	12/71	F	1	WISC 96	2.0	1.0	1.0	N	high selfmotivation	-0.1 +0.1 37	V-1, V-2 A-1, A-3	100%obj at 80% mastery	18	PE 3,4,12 PC 4; PD 3,4,8 PF 1; PE 8,11	90% obj at 80% mastery	2.0	2 per 35min
R-5	8/71	M	1	WISC 107	2.1	1.1	1.0	N	high selfmotivation	-0.1 +0.1 43	V-1, V-5, V-7 A-1, A-6	100%obj at 80% mastery	25	PB 6,8,10,20,21,22 PB 25,37,45,46,68 PE 3,12	60% obj at 80% mastery	2.2	2 per 35min
R-6	8/71	F	1	SFTA 85	1.9	1.0	.9	N	left handed poor handwriting	-0.2 37	V-2, V-7 A-1, A-6	100%obj at 80% mastery	25	PB 10,11,12,37,45,46 PB 51, 52,68 PE 3,4	60% obj at 80% mastery	1.7	2 per 35min
R-7	2/71	M	1	WISC 100	2.0	1.0	1.0	N	afraid of failure	-0.2 34	V-2, A-1 A-5, A-6	100%obj at 80% mastery	25	PB 10, 37, 45,46,51,56 PE 3,8 PF 1	60% obj at 80% mastery	1.8	2 per 35min
R-8	3/70	M	1	WISC 85	1.9	1.0	.9	N	short attention	-0.2 43	V-1, V-6 A-1, A-7	100%obj at 80% mastery	30	PB 25,37,45,46; PE 4,12 PC 4; PD 3,4,8 PF 1; PE 8,10,18	50% obj at 80% mastery	1.7	2 per 50min
R-9	1/71	M	1	SFTA 110	2.1	1.0	1.1	A	glasses	-0.1 34	V-1, V-2 V-4, V-5	100%obj at 80% mastery	25	PB 45,51,52,68 PE 3,12; PD 3,4,8 PF 1; PE 8,10,18,11	60% obj at 80% mastery	2.0	2 per 45min
R-10	4/71	M	1	SFTA 101	2.0	1.5	.5	N	patch on left eye glasses speech therapy	-0.3 34	V-1, V-2 V-5, A-1 A-5	100%obj at 80% mastery	29	PB 20,25,46,52; PE 3 PD 3,4,8; PF 1; PE 8,10 PE 18,11	50% obj at 80% mastery	2.2	2 per 45min
R-11	1/70	M	1	WISC 94	1.9	1.3	.6	A		-0.1 24	V-1, V-2 V-4	100%obj at 80% mastery	12	PB 25,37,46,51; PC 4 PD 3,4,8 PE 8,10,18	70% obj at 80% mastery	2.0	2 per 40min
R-12	3/70	M	1	SFTA 93	1.9	1.0	.9	N		-0.0 33	V-1, V-2	100%obj at 80% mastery	27	PB 25,37,46,51; PC 4 PD 3,4,8 PE 8,10,18	50% obj at 80% mastery	1.9	2 per 40min

PUPILS WITH PROBLEMS IN PERCEPTION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Deficit	Modality	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	MEA Level	Instr. Time
R13	6/70	M	1	SFTA 104	2.0	1.0	1.0	N	-0	47	V-1, A-8	100%obj at 80% mastery	35	PB 25,37,46,52; PE 12 PC 4; PD 3,4,8; PF 1 PE 8,10,18,11	70% obj at 80% mastery	2.0	2 per 40min
R14	10/70	M	1	SFTA 100	2.0	1.1	.9	N	-0	39	V-1, V-5 A-8	100%obj at 80% mastery	25	PB 6,9,25,46,51,52 PC 4; PD 3,4,8; PE 10,8 PE 18,11	50% obj at 80% mastery	2.0	2 per 35min
R15	11/70	M	2	WISC 116	3.3	1.0	2.3	N	hostile parents resent remedial program -0.3	37	V-2, V-6 A-1, A-6	100%obj at 80% mastery	20	PB 37,45,46,51,52,68 PE 3,4,12; PD 8 PF 1; PE 8	60% obj at 80% mastery	1.9	2 per 35min
R16	4/70	M	2	SFTA 106	3.1	1.1	2.0	N	reversals -0	36	V-1, V-2 V-7	100%obj at 80% mastery	25	PB 6,7,10,21,22,25,37,45,46 PE 51,52,68 PE 3,4; PFI 8	60% obj at 80% mastery	2.1	2 per 35min
R17	10/70	M	2	SFTA 94	2.9	1.9	1.0	V	immature left handed -0.2	28	V-6, A-2 A-3, A-6	100%obj at 80% mastery	15	PB 37, 45,46,51,52,68 PE 3,4,12; PC 4; PD 3 PD 3,4,8; PF 1	60% obj at 80% mastery	2.6	2 per 35min
R18	7/70	M	2	SFTA 94	2.9	1.9	1.0	N	easily distracted -0.1	41	V-1, V-2 A-1, A-3	100%obj at 80% mastery	30	PB 6,7,8,9,10,11,20 PB 21,22, 25,37,45,46 PB 51,52,68	60% obj at 80% mastery	2.7	2 per 35min
R19	4/70	M	2	WISC 117	3.3	2.1	1.2	A	reversals -0.2	51	V-2, V-5 V-7	100%obj at 80% mastery	35	PB 63; PE 3,4,7,10	95% obj at 90% mastery	3.1	1 per 30min
R20	12/70	F	2	SFTA 96	2.9	2.3	.6	V	-0	39	A-1, A-2 A-3, A-5	100%obj at 80% mastery	20	PB 26,34,42,48,49,54 PB 55,63; PE 3,4 PD 3,7,8	50% obj at 80% mastery	3.3	2 per 50min
R21	1/70	M	2	SFTA 77	2.5	1.9	.6	N	-0	42	V-1, V-5 A-1	100%obj at 80% mastery	30	PB 33,34,38,54,55,63 PE 4; PC 2,10,11; PF 5 PD 3,4,7; PE 14, 7, 19	60% obj at 80% mastery	2.7	2 per 40min
R22	10/70	F	2	WISC 101	3.0	1.6	1.4	N	poor language development -0.2	49	V-3, V-5 A-5, A-6	100%obj at 80% mastery	25	PB 34,38,42,63 PC 2; PF 4,5; PD 8 PE 14, 10	80% obj at 80% mastery	2.4	2 per 35min
R23	8/70	F	2	WISC 111	3.2	1.1	2.1	V	-0.1	43	V-5, A-1 A-2, A-6	100%obj at 80% mastery	30	PB 34,48; PE 14, 10, 7 PF 4,5 PD 8	80% obj at 80% mastery	2.1	2 per 35min
R24	8/70	F	2	SFTA 79	2.6	1.9	.7	N	short attention distractable -0.1	56	V-1, V-7 A-1, A-3 A-7	100%obj at 80% mastery	40	PB 25,37,45,46,51,52,68 PD 3,4,8 PE 8, 10, 13	50% obj at 80% mastery	2.6	2 per 40min

PUPILS WITH PROBLEMS IN PERCEPTION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Deficit	Modality	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	MEA Level	Instr. Time
R25	4/67	F	3	SFTA 84	3.5	2.3	1.2	N	defeatist poor self-image poor language dev.	-0.2 45	V-1, A-1 A-2, A-3	100% obj at 70% mastery	30	PB 38,48,49,54,55,63 PE 7, 10 PF 5	60% obj at 80% mastery	2.9	2 per 35min
R26	10/68	F	3	SFTA 82	3.5	2.2	1.3	N	twists words low ability	-0.1 59	V-1, V-2 A-1, A-3	100%obj at 70% mastery	39	PB 26,27,28,29,33,34 PB 35,38,42,48,54 PE 7, 10	70% obj at 80% mastery	2.9	2 per 35min
R27	12/69	M	3	WISC 88	3.6	3.0	.6	A	short attention	-0.2 39	V-1, V-7 A-2, A-3	100%obj at 70% mastery	25	IB 2,3,11, 16, 17,20,21 IB 22, 23,25,26	50% obj at 70% mastery	3.7	1 per 35min
R28	6/69	M	3	SFTA 107	4.2	2.9	1.3	N		-0.0 49	V-1, V-6 V-7, A-2	100%obj at 70% mastery	30	IB 2,3,11,12,16,17,25,26 IB 30,31,32; IE 1; IC3,16,18 ID 2,4,7,8; IF 1; IE13,10,15	50% obj at 85% mastery	4.0	2 per 40min
R29	10/69	F	3	SFTA 80	3.4	2.1	1.3	N	hyperactive	-0.1 53	V-1, V-5 A-2, A-6	100%obj at 80% mastery	32	IB 2,3,11,12,17,23,30,31,32 IE 4; IC 3,16,18; ID1,4,7,8 IF 1; IE 13,10,8,9	60% obj at 80% mastery	2.8	2 per 40min
R30	9/69	M	3	SFTA 84	3.5	2.2	1.3	V		-0.0 42	A-1, A-2 A-6	100%obj at 80% mastery	25	IB 2,3,12,20,21 IB 26,27,30,31; IC 3 IE 1,4,8,9,10	70% obj at 80% mastery	3.0	2 per 40min
R31	9/69	F	3	SFTA 89	3.7	1.0	2.7	N	tested and recommended for LD placement	-0.1 47	V-3, V-5 A-2, A-5 A-6	80%obj at 80% mastery	30	PB 10,20,22,25,46,51,52 PC 4; PD 3,4,8; PF 1 PE 8,10,18,11	80%obj at 80% mastery	1.8	2 per 35min
R32	8/69	M	3	SFTA 89	3.7	2.5	1.2	N	hyperactive short attention	-0.3 39	V-1, V-2 V-7, A-2	100%obj at 80% mastery	25	PB 28,33,34,42,49,63 PE 3; PC 10,11 PD 3	80% obj at 85% mastery	3.1	1 per 40min
R33	5/69	M	3	SFTA 89	3.7	2.1	1.6	N	immature no self-confidence	-0.3 45	V-1, V-2 A-1, A-3	100%obj at 80% mastery	30	PB 34,42,49,63; PC 2 PC 10,11 PD 3	80% obj at 85% mastery	2.7	1 per 40min
R34	6/68	F	4	SFTA 86	4.4	3.1	1.3	N	poor coordination	-0.1 32	V-1, V-2 A-2, A-3	100%obj at 80% mastery	18	IB 11,12,16,25,30,32; IE 1 IC 27,3,16,18; ID 1,2,7,8 IE 13,15,8	70% obj at 90% mastery	3.9	2 per 35min
R35	8/68	F	4	SFTA 89	4.6	2.1	2.5	N		-0.0 20	V-1, A-1	100%obj at 80% mastery	10	IB 11,12,16,25,26,30,31,32 IE 1,4; IC 3,16,18; ID 1,7 IE 8,9	70% obj at 90% mastery	3.0	2 per 35min
R36	12/67	F	4	WISC 92	4.7	2.9	1.8	A		-0.1 25	V-1, V-2	100%obj at 80% mastery	13	IB 2,3,11,12,17,25,26,27,32 IC 3,16,18; ID 1,2,4 IE 15,8,9,14	70% obj at 90% mastery	3.7	2 per 35min

PUPILS WITH PROBLEMS IN PERCEPTION

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Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Deficit	Modality	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	MEA Level	Instr. Time	
R37	11/67	M	4	SFTA 83	4.3	2.6	1.7	N	disorganized	-1	49	V-1, V-4 A-1, A-3	100%obj at 80% mastery	35	IB 16,20,25,26,31; IE 1,4 IC 37,3,16,18; ID 1,2,4 IE 15,8,9,14	70% obj at 90% mastery	3.3	2 per 35min
R38	12/67	M	4	SFTA 104	5.2	3.9	1.3	N	hyperactive	-2	36	V-1, A-2 A-3	100%obj at 70% mastery	20	IB 19; IC 2,16; ID 2,8 IE 7,9,15,18 IF 23	70% obj at 80% mastery	4.7	1 per 40min
R39	7/68	M	4	SFTA 97	4.9	3.4	1.5	N	hyperactive	-1	39	V-5 A-1, A-6	100%obj at 80% mastery	20	IB 2,3,11,21,25,26,27 ID 7,8 IE 13,10,9,14,8,15	50% obj at 80% mastery	4.3	2 per 40min
R40	11/67	M	4	SFTA 71	3.8	2.1	1.7	N	Learning disabled	-1	67	V-5, V-7 A-6, V-2	100%obj at 80% mastery	45	PB 26,27,28,29,33,34,38 PB 42,48,49,54,55,93	60% obj at 80% mastery	2.7	2 per 40min
R41	6/67	M	4	SFTA 90	4.6	2.1	2.5	N	Learning disabled	-1	59	V-1, V-5 V-7, A-1	100%obj at 70% mastery	40	PB 26,27,28,29,33,34,38,42 PB 48,49,54,63	80% obj at 80% mastery	2.9	2 per 40min
R42	9/67	M	4	SFTA 96	4.8	3.7	1.1	N	social/emotional problems	-1	52	V-3, V-5 A-5, A-6	100%obj at 70% mastery	40	IB 2,3,11,15,17,18 IC 16,18; ID 7,8 IE 13,14	80% obj at 80% mastery	4.6	2 per 35min
R43	8/68	M	4	SFTA 81	4.3	2.3	2.0	A	absent often	-1	29	V-1, V-2 V-5, V-7	100%obj at 80% mastery	15	PE 3,4; PC 2, 10,11; PD 3,4 PF 4,5; PE 7, 10,19,11	80% obj at 75% mastery	3.0	2 per 35min
R44	5/68	M	4	SFTA 76	4.0	1.7	2.3	N	slow learner	-0	55	V-1, V-7 A-6	100%obj at 80% mastery	30	PB 25, 37,45,46,51,52,68 PE 3; PF 1 PE 8,11	70% obj at 75% mastery	2.5	2 per 35min
R45	8/68	M	4	WISC 104	5.2	3.4	1.8	N	fearful	-2	52	V-3, V-4 A-4	100%obj at 80% mastery	40	IB 2,3,12,17,21,22 IB 25,26,27,30,31	60% obj at 70% mastery	4.2	2 per 50min
R46	5/68	M	4	WISC 100	5.0	2.6	2.4	N		-1	36	V-1, V-2 V-3, V-7	100%obj at 80% mastery	25	IB 21,22,25,27,30,31 IB 32; IE 1; IC 3 IC 16, 18	75% obj at 80% mastery	3.5	2 per 50min
R47	11/67	M	4	WISC 96	4.8	3.4	1.4	N		-1	39	V-1, V-4 A-4, A-6	100%obj at 80% mastery	25	IB 27,28,32,19 IC 7,11; IF 2; IE 9,7,13	80% obj at 80% mastery	4.3	2 per 40min
R48	4/68	M	4	WISC 92	4.7	2.1	2.6	N	hyperactive	-2	42	V-5 A-2, A-3	100%obj at 80% mastery	30	PB 26,28,29,42,48,63 PE 3,4; PC 10,11; PD 3,4	80% obj at 80% mastery	2.8	2 per 35min

PUPILS WITH PROBLEMS IN PERCEPTION

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Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Def-icit	Modal-ity	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	MEA Level	Instr. Time
R49	9/66	M	5	SFTA 90	5.5	2.1	3.4	N	poor concentration -.2	35	V-4, V-6 A-4, A-7	100%obj at 80% mastery	20	IB 31,32,19; IC 7; ID 8 IE 9, 10,13; IF 18	65% obj at 80% mastery	2.8	1 per 45min
R50	8/67	M	3	SFTA 90	5.5	2.6	2.9	N	disruptive poor self-image -.2	42	V-2, A-1 A-2, A-3	100%obj at 80% mastery	30	PB 26,27,29,33 PB 34,38,42,48,49 PB 54,55,63	80% obj at 80% mastery	3.3	2 per 40min
R51	9/66	M	5	WISC 99	6.0	3.3	2.7	N	-.1	37	V-4, V-5 A-1, A16	100%obj at 80% mastery	20	IB 2,3,37,32 IC 3; ID 8 IE 9	100%obj at 80% mastery	4.2	2 per 40min
R52	9/66	M	5	WISC 87	5.4	4.2	1.2	N	-.1	29	V-4, V-5 A-2, A-3	100%obj at 80% mastery	15	IB 25,26,27,28,29 IB 30,31,32; IE 3,4 IC 2	80% obj at 80% mastery	5.0	2 per 45min
R53	2/67	M	5	SFTA 97	5.9	2.1	3.8	N	hyperactive -.2	54	V-1, A-1 A-2, A-3 A-6	100%obj at 70% mastery	30	PB 26,27,29,33,42,63 PC 11,24; PD 3	70% obj at 75% mastery	2.9	1 per 45min
R54	3/66	F	6	SFTA 74	5.4	3.7	1.7	N	low ability -.1	36	V-1, V-5 A-6	100%obj at 70% mastery	20	IB 28,30,31; IC 2,7 ID 1; IE 9,10,13,18	70% obj at 30% mastery	4.3	1 per 45min
R55	8/66	F	6	WISC 106	7.4	4.5	2.9	N	disorganization -.2	49	V-2, V-3 A-5, A-6	100%obj at 70% mastery	30	IC 8,12,26,31 ID 1,2,7,9,10	70% obj at 80% mastery	5.4	1 per 40min
R56	8/65	M	6	SFTA 74	5.4	2.1	3.3	N	low ability -.0	37	A-2, A-3 A-6	100%obj at 80% mastery	20	IB 2,3,17,27 IF 1; IE 10,13,15; IE 17	80% obj at 80% mastery	2.8	2 per 35min
R57	12/65	M	6	SFTA 90	6.4	4.9	1.5	N	-.0	35	A-1, A-2 A-3, A-6	100%obj at 60% mastery	20	IC 25,31,39; ID 4,8,9 IE 7,9,14,16,18; IF 4,6 IF 17,23	60% obj at 80% mastery	5.8	2 per 40min
R58	3/65	M	7	SFTA 80	6.6	2.9	3.7	N	socio-emotional -.1	29	V-4, V-6 A-4, A-7	100%obj at 70% mastery	15	IC 31; ID 2,7 IE 7,9,10,13,15,18 IF 4,11,12	60% obj at 75% mastery	3.6	2 per 40min
R59	7/65	F	7	SFTA 90	7.3	3.7	3.6	A	-.0	32	V-1, V-2 V-4, V-5	100%obj at 60% mastery	15	IB 22,27; IE 4; IC 3,16 ID 7; IE 13,10,15,8,9,14	60% obj at 75% mastery	4.6	2 per 35min
R60	8/69	M	7	SFTA 94	7.6	6.3	1.3	A	fine motor -.0	29	V-7, V-5	100%obj at 70% mastery	15	IC 2,7; ID 3,4 IE 7,9,12,13,16,18 IF 13,14,5,9,12,21	100%obj at 80% mastery	7.2	2 per 45min

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Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Deficit	Modality	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	MEA Level	Instr. Time
M61	9/66	M	7	SFTA 114	9.0	2.1	6.9	N	+2 excellent vocab.	45	V-2 A-5, A-6	100%obj at 80% mastery	30	IB 2,11,16,17,21,30,31,32 IE 1; IC 3,7,16,18 ID.1,2,7; IE 9	80% obj at 80% mastery	3.4	4 per 55min
M62	11/70	M	1	SFTA 81	2.1	1.0	1.1	N	-.1 easily distracted short attention	34	V-3, A-2 A-4	100%obj at 80% mastery	20	NN 7,35; W 2,8,4 NN 42,53; M 27; MS 26 CP 13,18,24,27,23,25	80% obj at 80% mastery	1.8	2 per 30min
M63	2/71	M	1	SFTA 100	2.7	1.5	1.2	N	-.1	40	V-4, V-6	100%obj at 85% mastery	25	W 32,34,35,38,39,41	100%obj at 85% mastery	2.4	1 per 40min
M64	6/70	F	2	WISC 104	3.5	2.5	1.0	N	-.2 poor self-esteem low confidence	52	A-1, A-5 V-2, V-6	100%obj at 60% mastery	40	W 3,1,29,30; CP 47,55,57 W 36,39,40,41,47,61,69 F 1; M 27,28,32	60% obj at 85% mastery	3.3	2 per 30min
M65	3/70	M	2	SFTA 93	3.2	1.0	2.2	N	-.1 rheumatoid arthritis	45	V-5, V-6 V-7	100%obj at 80% mastery	30	W 3,10,12; CP 27; W 28,29,30 CP 47,55,57; W 36,39,40,41 W 47	70% obj at 85% mastery	1.8	2 per 30min
M66	8/70	F	2	SFTA 79	2.6	1.2	1.4	N	-.2 hyperactive poor attention	49	V-1, V-4 V-6, V-7	100%obj at 80% mastery	30	W 3,10,1,2,8,4,5 CP 11,13,27,23,47,55	70% obj at 85% mastery	1.8	2 per 40min
M67	5/70	F	2	WISC 95	3.1	2.1	1.0	V	-.2 identified for LD placement	37	A-5, A-4 A-6	100%obj at 75% mastery	25	W 1,2,3,84,5; CP 11,13 W 26; CP 27,33; W 28 CP 47,55	75% obj at 75% mastery	2.9	2 per 40min
M68	5/69	M	2	SFTA 85	3.6	1.7	1.9	N	-.2 lacks confidence	56	V-1, V-2 A-4	100%obj at 75% mastery	40	W 1; CP 13,27,23 W 28; CP 47,55,57; F 1	60% obj at 80% mastery	2.4	1 per 45min
M69	4/70	F	2	WISC 80	2.7	1.0	1.7	N	-.3 speech therapy	58	V-1, V-4 V-5, V-7	100%obj at 60% mastery	35	NN 15,22,45; W 2; M 27 MS 26; CP 24,27,23,25,45, CP 55,57	70% obj at 80% mastery	1.5	1 per 40min
M70	1/70	F	2	SFTA 96	3.6	1.9	1.7	N	-.0	49	V-1, V-5 V-7, A-1 A-5	100%obj at 60% mastery	30	W 2, 84, 3,5,10,27 F 25,27,28,31,33	60% obj at 80% mastery	2.9	2 per 35min
M71	7/70	M	2	SFTA 94	3.0	1.9	1.1	N	-.2 hyperactive short attention	43	V-5, V-6 A-6, A-7	100%obj at 70% mastery	25	M 27, 28,32 W 32,34,35	100%obj at 80% mastery	2.6	2 per 40min
M72	7/69	F	3	SFTA 101	4.3	2.6	1.7	N	-.0	29	V-2, V-5 V-1	100%obj at 70% mastery	15	W 5,4,7,6,64,65 W 37,38,41,43,48 49,50	80% obj at 80% mastery	3.6	2 per 35min

PUPILS WITH PROBLEMS IN PERCEPTION

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Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Deficit	Modality	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	NEA Level	Instr. Time
M73	12/68	M	3	SFTA 100	4.8	3.7	1.1	N	-0	49	V-2, V-3 A-5, A-7	100%obj at 60% mastery	30	W 3,7,64,32,65,36,37 W 39,41,42,43,47,48,50	60% obj at 80% mastery	4.7	2 per 35min
M74	8/69	M	3	SFTA 91	3.6	2.1	1.5	N	-0	57	V-1, V-2, V-5, V-7 A-6	100%obj at 60% mastery	35	W 3,10,1,84,5; NN 42 CP 11, 13,27,28 W 28,29,30	75% obj at 80% mastery	3.0	2 per 40min
M75	3/69	M	3	SFTA 105	4.8	3.2	1.6	A	-0	53	V-5, V-7	100%obj at 80% mastery	35	NN 7; W 32,1,5,84 NN 42,26,27,23,28; W 29,30 CP 47,55	75% obj at 80% mastery	4.3	2 per 30min
M76	9/69	F	3	WISC 89	3.5	1.7	1.8	N	-1 problems with visual fusion	52	V-1, V-2 V-3	100%obj at 80% mastery	35	NN 7; W 1,2,3,5,84 NN 42,26,27,23,28 CP 47,45	60% obj at 75% mastery	2.5	2 per 40min
M77	3/69	M	3	SFTA 89	3.9	2.8	1.1	N	-2 poor attention	42	V-1, V-2 V-4	100%obj at 70% mastery	30	W 1,8,4,7,10,28,30 W 97,48,49,50,61,69	60% obj at 80% mastery	3.5	1 per 40min
M78	6/69	M	3	WISC 88	3.7	2.5	1.2	N	-3 hyperactive short attention	52	V-5, V-6 A-6, A-7	100%obj at 70% mastery	40	W 4,6,12,32,38,39,41	80% obj at 80% mastery	3.2	2 per 35min
M79	8/68	M	3	SFTA 81	3.9	3.2	.7	N	-1 short attention	49	V-1, V-6 V-7, A-4	100%obj at 70% mastery	39	W 84,85,32,38,39,43	60% obj at 80% mastery	3.9	2 per 40min
M80	4/69	F	3	WISC 91	4.0	2.1	1.9	N	-2 short attention	54	V-6, V-4 A-7	100%obj at 80% mastery	40	W 4,6,12,38,39 W 41,54,55,56	90% obj at 80% mastery	2.8	2 per 35min
M81	6/69	F	3	SFTA 95	4.0	2.8	1.2	N	-1	39	V-1, V-2 V-4	100%obj at 80% mastery	25	W 38,39,50 W 51,52,79	90% obj at 80% mastery	3.7	1 per 25min
M82	7/67	M	4	SFTA 95	5.9	3.9	2.0	N	-0	47	V-1, V-2 V-5, A-6	100%obj at 80% mastery	30	W 4,12,32,37,66,42,43,44,49 W 50,51,53,55,88; F 5,6	70% obj at 80% mastery	4.9	2 per 35min
M83	6/68	M	4	SFTA 85	4.3	2.8	1.5	N	-0	39	V-1, V-2 V-5	100%obj at 70% mastery	25	W 4,12,6,7,32,36,37 W 39,41,42,43,44	70% obj at 90% mastery	3.7	2 per 40min
M84	10/67	F	4	SFTA 94	5.5	3.1	2.2	N	-1	42	V-5, V-6 A-6	100%obj at 80% mastery	30	W 6,7,8,38; M 32; W 44,45 W 65,78	80% obj at 80% mastery	3.9	1 per 40min

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Deficit	Modality	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	MEA Level	Instr Time
M85	5/68	M	4	SFTA 76	3.8	3.2	.6	N	-.2 poor attendance low energy level	32	V-3, V-5 A-6	100%obj at 80% mastery	20	W 2,4,7,38,39 M 27,28,32; W32	60% obj at 80% mastery	3.8	2 per 40min
M86	9/67	M	4	WISC 95	5.0	3.9	1.9	N	-.2	39	V-1, V-2 V-5, A-6	100%obj at 80% mastery	25	W 4,12,36,37,41 W 42,43,44	75% obj at 75% mastery	4.7	1 per 35min
M87	5/68	M	4	SFTA 92	4.9	3.8	1.1	N	-.0	32	V-1, V-5 A-1, A-6	100%obj at 80% mastery	20	W 4,12,36,37,41 W 42,43,44	75% obj at 75% mastery	4.7	2 per 35min
M88	10/68	F	4	SFTA 110	5.8	3.9	1.9	N	-.0	40	V-6, V-7	100%obj at 80% mastery	25	W 11,10,29,28,30,32,34 W 35,36,37,39,40,41 W 42,43,47,48,49,50	75% obj at 80% mastery	5.0	2 per 30min
M89	11/67	M	4	SFTA 96	5.7	4.1	1.6	N	-.0	29	V-2, A-6, A-7	100%obj at 80% mastery	15	W 4,12,6,36,37,39,41,42,43 W 44,47,48,49,50,51,52,53,55 F 3;W88; F5,6,11,26,30,35,57	80% obj at 80% mastery	5.1	2 per 30min
M90	7/66	M	5	SFTA 109	8.0	3.8	4.2	N	-.1	41	V-1, V-2 V-4, V-6	100%obj at 80% mastery	30	W 30,32,37,41,44,42,43,49,50 W 51,53,55,82; F 5	75% obj at 80% mastery	4.8	1 per 40min
M91	4/67	F	5	SFTA 87	5.5	3.7	1.8	N	-.1 poor peer acceptance	36	V-3, V-4 V-5, V-7	100%obj at 80% mastery	25	W 4,12,64,41,42,43,44 W 49,50,57,53,55,88 F 5	75% obj at 80% mastery	4.5	2 per 40min
M92	10/66	M	5	SFTA 109	7.7	5.4	2.3	N	-.0	42	V-1, V-3 V-4, V-7	100%obj at 80% mastery	30	W 9,45,52,81,21; F 5,25,27 F 28,31,33	60% obj at 80% mastery	6.5	2 per 35min
M93	9/66	M	5	WISC 99	7.0	4.5	2.5	N	-.1	37	V-3, V-4 V-5	100%obj at 80% mastery	25	W 3,4,6,7,36,37,88,41,42,43 W 44,48,53,55,78; F 3,5,6,11 F 25,26,30	65% obj at 80% mastery	5.4	2 per 40min
M94	9/66	M	5	SFTA 83	5.7	4.4	1.3	N	-.1	42	V-1, V-2 V-3, V-6	100%obj at 80% mastery	35	W 11,6,30,32,36,37,39,41 W 43,47,48,49,50,78	60% obj at 80% mastery	5.1	1 per 45min
M95	3/66	F	6	SFTA 74	5.0	2.7	2.3	N	-.1 low ability	39	V-1, V-3 V-5	100%obj at 80% mastery	25	W 3,7,64,30,65,36,37,42 W 43,47,48,49,50	100%obj at 80% mastery	3.3	1 per 40min
M96	6/67	M	6	WISC 108	6.9	3.1	3.8	A	-.2 cerebral palsy	42	V-1, V-4 V-5	100%obj at 80% mastery	35	W 4,6,7,12,32,41,42,47, W 53,78; F 3,5,6,11,25, F 30,35,56,57,69	70% obj at 85% mastery	4.0	2 per 30min

PUPILS WITH PROBLEMS IN PERCEPTION

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Student Number	Birth Date	Sex	School Years	IQ	Expectancy	Pre-Test	Deficit	Modality	Other Factors	Percep. Score	Perception Objectives	Predict Mastery	Predict Posttest	Reading/Arithmetic Instructional Objectives	Predict Mastery	MEA Level	Instr. Time
M97	8/65	M	7	SFTA 92	7.3	3.8	3.5	N	-.1 poor self-image	35	V-1, V-5 V-7, V-6	100%obj at 80% mastery	25	W 30,27,45,55,23,91,87,88 F 11,25,30,27,31	70% obj at 85% mastery	4.6	2 per 30min
M98	4/65	M	7	WISC 96	8.0	4.1	3.9	N	-.3 low motivation poor home condit.	39	V-1, V-4 V-5, V-6	100%obj at 80% mastery	25	W 44,45,55,81,23,91,87,88 F 5,27,31,29,33,34,35,57 F 39,13	60% obj at 75% mastery	4.8	2 per 35min
M99	8/65	F	7	SFTA 78	6.0	3.7	2.3	N	-.0 poor copying skill-perception	52	V-1, V-2 V-3, V-7	100%obj at 80% mastery	35	W 20,45,52,55,81,23 W 91,87,88; F 5,6,11,27 F 31,29,33,34,35,39	95% obj at 75% mastery	4.5	2 per 35min
M100	3/65	M	7	SFTA 80	6.6	5.3	1.3	N	-.2 poor attendance inhibited	32	V-1, V-2 V-5, V-7	100%obj at 80% mastery	20	W 37,45,52,55,75,81 W 23,91,87,88 F 5,6,11	75% obj at 80% mastery	5.9	2 per 35min

Terminal Performance Objectives

The expected outcomes of instruction were defined in three terminal performance objectives.

Terminal Performance Objective 1. Given two periods of instruction per week, each student will show improvement in reading or arithmetic by attaining or exceeding the modified expected achievement level shown in column 17, table 6.

An expected achievement level as an outcome of remedial instruction was predicted for each student in the project. The expected achievement level was based on the child's pretest score and his IQ (divided by 100). For example, a child with a pretest score of 5.2 and an IQ of 110 was expected to obtain an achievement level of 6.3 on the posttest. Simply stated:

$$\text{Expected Achievement} = \text{Pretest GE} + \frac{\text{IQ}}{100}$$

$$\text{Expected Achievement} = 5.2 + 1.1 = 6.3$$

All of the children in this project were perceptually impaired. Also, many demonstrated other behaviors that were impediments to learning. The formula for the expected achievement level was modified to take into account the students' perceptual deficits and other factors that affect learning. The value of .1 was deducted from the expected achievement level for each negative factor. The value of .1 was added for each positive factor. The result was a modified expected achievement (MEA) level.¹⁵

$$\text{MEA Level} = \text{Pretest GE} + 100 \pm \text{Other Factors}$$

¹⁵ The MEA level should not be confused with the reading expectancy or the math expectancy. Expectancies are used to demonstrate the need for remediation. The MEA level, on the other hand, is a goal.

Using the data shown in the columns of the pupil data sheets, table 6, the teachers computed a modified expected achievement level for each student. The predicted MEA level for each student is shown in column 17, table 6. Computations for the students' MEA levels are included in appendix 1. The performance objective would be met when all students had reached their MEA levels on the posttest.

Terminal Performance Objective 2. Given two periods of instruction per week, each student will accomplish the objectives in column 15, table 6, at the criterion level specified in column 16, table 6.

Specific instructional objectives were identified for each student and were written into his IIP. The code numbers of the objectives are in column 15, table 6. Reading objectives are listed in appendix 3; arithmetic objectives are listed in appendix 4. Each child was expected to master a specified percent of his objectives at a given level of mastery. Student R1, for example, was expected to complete at least 60 percent of his objectives with 80 percent mastery. With auditory and visual perception problems, immaturity, frequent absence, and average intelligence, the child was expected to perform with 80 percent mastery on at least 7 of the 12 objectives written into his IIP. Specifying 7 out of 12 objectives did not mean that five of the objectives were not to be attempted. All objectives were to be taught. What the mastery prediction said was that at least 7 of the 12 would be accomplished at an 80 percent mastery level by the end of the program. The remaining might still be "in process" when the school year ended. Student R4, with high self-motivation, perception problems, and fewer instructional objectives, was expected to complete 90 percent or 9 of the 10 objectives at an 80 percent level of mastery. Mastery predictions were made by the remedial teachers who were working with the children and were based on teacher judgment.

The extent of each student's mastery was to be reported on the Mastery of Objectives form (figure 2) at the end of the program. Data from the teachers' report forms would be compared with the data in columns 15 and 16, table 6. Performance objective 2 would be met when all students had completed the objectives in column 15 at the predicted mastery level specified in column 16.

Terminal Performance Objective 3. Given perceptual training, each student will demonstrate improvement in the perception objectives in column 12, table 6, according to the mastery predictions in columns 13 and 14, table 6.

The Slingerland Screening Tests were administered to identify perceptual deficits which are listed by code number in column 12 and are defined on pages 54-55. The predicted mastery in column 13 said that all perception objectives in column 12 would be accomplished with 80 percent mastery at a difficulty level consistent with the child's maturity and with other factors which affect his learning. The number of errors made on the Slingerland was recorded in column 11 as an entry level perception score. Scores ranged from 20 to 67. Given perception training, each student was expected to show a reduction in the number of perception errors when given the Slingerland as a posttest. A posttest score was predicted for each student and is shown in column 14. Predicted posttest scores ranged from 10 to 40. Each prediction was based on the teacher's opinion of the child's ability to show improvement in the perceptual tasks which were sampled by the Slingerland. Results were to be reported on the Mastery of Objectives form shown in figure 2. The objective would be met when all students had met the mastery predictions in columns 13 and 14.

MASTERY OF OBJECTIVES

READING/ARITHMETIC
PERCEPTION
1978--1979

Directions: Fill in the school code number, grade level, and name of each child in the study group. On the lines to the right, list the code numbers of the objectives which the child has completed at his predicted mastery level (column 16). On the lines at the extreme right, list the code numbers of the objectives that are still in process.

[illegible]

Figure 2. Form for reporting students' mastery of objectives.

Students' Individual Objectives

Given two periods of remedial instruction per week which included perceptual training, each child was expected to make gains in reading or arithmetic which were commensurate with his intelligence and other factors that went into the formula for calculating the MEA level. In addition, each student was expected to show improved performance in perceptual skills as indicated by a reduction in the error score on the perception posttest. Mastery levels were predicted for each child.

Each student's objectives are listed by code number in the various columns in table 6, pages 31-39. Perception objectives are in column 12; reading or arithmetic objectives are in column 15. Predicted mastery levels are in column 13 for perception and column 16 for reading and arithmetic. Predicted posttest perception scores are in column 14. Predicted reading or arithmetic posttest scores are in column 17 (MEA level).

Perception Objectives

Fourteen perception objectives written as terminal behaviors were identified for this project and are listed on pages 54-55 and are included in appendix 2 for easy reference. They reflect the visual and auditory deficits that were identified in the remedial students. All can be sampled with the Slingerland Screening Tests. All are prerequisite to reading and arithmetic skills.

Reading Objectives

Reading objectives stated as terminal behaviors are listed in appendix 3. Included are primary and intermediate level objectives for phonic analysis (PB, IB), structural analysis (PC, IC), vocabulary

development (PD, ID), comprehension skills (PE, IE), and study skills (PF, IF). They reflect the skills of reading from the beginning level through study skills at the upper intermediate level. The code numbers are the catalog numbers of the test objectives which are listed in the SRA Catalog of Objectives, SOBAR Reading. The catalog contains many more objectives than are being used in the remedial program. Only the objectives which are appropriate for the remedial reading population are included in this project.

Arithmetic Objectives

The arithmetic objectives stated in terminal behaviors in appendix 4 include 35 primary objectives usually taught in grades one and two and 183 higher level objectives usually taught in the upper elementary grades. Included in the intermediate objectives are 91 whole number objectives (W), seventy-five fractional numbers objectives (F), and 19 measurement objectives (M) which include money, time, and temperature. The code numbers are the catalog numbers of the test objectives which are listed in the SRA Catalog of Objectives, Mathematics. The catalog contains many more objectives than are being used in the remedial program. Only the objectives which are appropriate for the remedial arithmetic population are included in this project.

CHAPTER V

RATIONALE FOR A PROGRAM OF PERCEPTION

Conflicting Views on Perceptual Training

The decision to include perceptual training in the program was guided by an investigation of some of the studies in reading and learning disabilities. In the review of the literature three major views emerged: (1) poor reading appears to be related to perceptual deficit; (2) that teaching perception skills does not enhance academic skills and (3) knowledge of a child's perceptual modality and deficits can guide remedial instruction.

Learning Problems Related to Perceptual Deficits

That poor reading is related to inadequate visual analysis of complex structures was found in studies by de Hirsch, Jansky, and Langford,¹⁶ Lackmann,¹⁷ and Smith and Keogh.¹⁸ Learning to read involves learning the sounds of letters in words. Children need to be able to make auditory discriminations between sounds and be able to analyze words into their

¹⁶Katrina de Hirsch, Jeanette Jefferson Jansky and William S. Langford, Predicting Reading Failure, (New York: Harper & Row, 1966), Chapter 5, p. 49.

¹⁷F. M. Lackmann, "Perceptual-Motor Development in Children Retarded in Reading Ability," Journal of Consulting Psychology 9 (1966), p. 310.

¹⁸C. E. Smith and B. K. Keogh, "The Group Bender-Gestalt as a Reading Readiness Screening Instrument," Perceptual and Motor Skills 15 (1962), p. 642.

component phonemes. De Hirsch, Jansky, and Langford,¹⁹ and Savin²⁰ showed that children who had auditory discrimination difficulties failed to learn to read. Wepman's studies demonstrated a relationship between poor auditory discrimination and poor reading skills.²¹

Children may have acquired both visual and auditory discrimination skills and still be unable to integrate the two for successful phoneme-grapheme association. That is, they are unable to translate print into speech sounds. Farnham-Diggory and Gregg,²² Jorgenson and Hyde,²³ and Vande Voort, Senf, and Benton²⁴ found that poor readers had difficulties with tasks which involved cross-modal integration of visual and auditory information processing.

¹⁹De Hirsch, Jansky, and Langford, p. 48.

²⁰H. B. Savin, "What the Child Knows about Speech when He Starts to Learn to Read," in Language by Ear and Eye, edited by J. F. Kavanagh and I. G. Mattingly, (Cambridge, Massachusetts: M.I.T. Press, 1972), p. 78.

²¹Joseph M. Wepman, "Auditory Discrimination, Speech and Reading," The Elementary School Journal, (March 1960), p. 342.

²²S. Farnham-Diggory and L. W. Gregg, "Short-Term Memory Function in Young Readers, Journal of Experimental Child Psychology 19 (1975), p. 292.

²³G. W. Jorgenson and E. M. Hyde, "Auditory-Visual Integration and Reading Performance in Lower-Social Class Children," Journal of Educational Psychology 66 (1974), p. 723.

²⁴L. Vande Voort, G. M. Senf, and A. L. Benton, "Development of Audio-Visual Integration in Normal and Retarded Readers," Child Development 43 (1972), p. 1265.

Printed letters and words are ordered in space from left to right while sounds are ordered in time. In reading it is necessary not only to remember the temporal order of spoken phonemes, but also to match them to the spatially ordered graphemes in printed words. Bryden found that poor readers could not perceive and remember word patterns as well as average readers.²⁵ Corkin found that long-term memory for order was deficient in poor readers.²⁶ Bakker found that poor readers were deficient in remembering the order of events in any kind of sequential pattern--visual, auditory, or haptic (kinesthetic).²⁷

Academic Learning Not Enhanced by Perceptual Training

While the vast body of research on perception appeared to show a relationship between poor academic performance and perceptual deficits, another body of literature indicated that training in perception did not necessarily enhance achievement in reading or arithmetic. Black, in a study of eight year old learning-disabled children classified as high-perceivers and low-perceivers, concluded that the instructional emphasis for disabled children should be upon good teaching and academic skills rather than on the remediation of splinter skills.²⁸

²⁵M. P. Bryden, "Auditory-Visual and Sequential-Spatial Matching in Relation to Reading Ability," Child Development 43 (1972), p. 831.

²⁶S. Corkin, "Serial-Ordering Deficits in Inferior Readers," Neuropsychologia 12 (1974), p. 350.

²⁷D. J. Bakker, Temporal Order and Disturbed Reading, (Rotterdam: Rotterdam University Press, 1972), p. 34.

²⁸William F. Black, "Achievement Test Performance of High and Low Perceiving Learning Disabled Children," Journal of Learning Disabilities 7 (March 1974), p. 182.

The American Academy of Pediatrics and the American Academy of Ophthalmology in 1972 made a joint organizational statement about the treatment of visual perception as an avenue to improving academic achievement. The statement said in part:²⁹

No known scientific evidence supports claims for improving the academic abilities of learning disabled or dyslexic children with treatment based solely on (a) visual training, or (b) neurological organizational training (laterality training, balance board, perceptual training).

Some reviews of the research on reading and perception refuted the relationship between the two. In their review of over 280 correlation coefficients depicting the relationship between auditory perception and reading, Hammill and Larson³⁰ found no practical relationship between sound-blending, discrimination, memory, or auditory-visual integration and word recognition or reading. Masland and Cratty, after an extensive review of research, concluded that the relationship between perception and reading had not been "sufficiently demonstrated." And the studies that compared reading instruction with perceptual training as a means of remediation found reading instruction to be more effective.³¹ Bateman, too recommended the direct teaching

²⁹ American Academy of Pediatrics and the American Academy of Ophthalmology (assisted by the president and past president of the Division for Children with Learning Disabilities, CED), "The Eye and Learning Disabilities," A joint organizational statement, Pediatric News 41 (February 1972), p. 54.

³⁰ Donald D. Hammill and Stephen C. Larsen, "The Relationship of Selected Auditory Perceptual Skills and Reading Ability," Journal of Learning Disabilities 7 (March 1974), p. 130.

³¹ Richard L. Masland and Bryant J. Cratty, "The Nature of the Reading Process, the Rationale of Noneducational Remedial Methods," Reading Forum, NINDS Monograph 11, (Bethesda, Maryland: National Institute of Neurological Diseases and Stroke, 1971), p. 72.

of reading skills rather than the treatment of underlying psychological processes.³²

The Current Disabilities View

Theorists and practitioners in the fields of reading and learning disabilities are stressing the importance of knowing which perceptual channels are debilitated and which channels are intact and can be used most effectively. Johnson and Myklebust,³³ de Hirsch, Jansky, and Langford,³⁴ and Whitsell³⁵ have concluded or have advocated that perceptual strength and weakness should largely determine the teaching methods for individual children. A profile of the child's sensory motor and perceptual capacities will indicate which input systems are most intact and available for learning as well as the weak functions which need support and development.³⁶ General guidelines for remediation by Kirk and Kirk recommend that children be taught through channels of sensory strength and that prerequisite deficiencies be remediated.³⁷ For example, if a child is a visual learner

³²Barbara Bateman, "The Role of Individual Diagnosis in Remedial Planning for Reading Disorders," Reading Forum, NINDS Monograph 11, (Bethesda, Maryland: National Institute of Neurological Diseases and Stroke, 1971), p. 135.

³³Doris J. Johnson and Helmer R. Myklebust, "Dyslexia in Childhood," in Learning Disorders, Vol. 1, edited by Jerome Hellmuth, (Seattle, Washington: Special Child Publications, Bernard K. Straub Publishers, 1965), p. 264.

³⁴de Hirsch, Jansky, and Langford, p. 82.

³⁵Leon J. Whitsell, "A Clinic Team Approach to Reading Problems: Role of the Neurologist," In Perception and Reading, edited by Helen K. Smith, pp. 72-77, (Newark, Delaware: International Reading Association 1968), p. 74.

³⁶Samuel A. Kirk and Winifred D. Kirk, Psycholinguistic Learning Disabilities: Diagnosis and Remediation, (Urbana, Illinois: University Of Illinois Press 1971), p. 121.

³⁷Ibid.

and lacks the auditory skills necessary to take spelling dictation, then spelling should be taught through a visual mode and the perceptual skills of auditory analysis, auditory synthesis, and auditory memory should be remediated with spelling and reading materials rather than with adjunct perceptual materials. A child with an auditory deficit should not be given math instruction solely in the auditory mode. Rather than giving a taped lesson, the teacher should intervene and demonstrate the math process. The child should have the opportunity to use his stronger sensory input modes (visual and kinesthetic) to experience new learning. The remedial teachers must teach to the major modality of the child and remediate the perceptual deficits which are prerequisite to reading and arithmetic skills.

Rationale for Accepting Disabilities View

Not all deficits in perception have a neurological basis and can be remediated to some extent. Kirk and Kirk suggest that

. . .among the culturally different or economically disadvantaged we find some deficits which are probably due to disuse and lack of training rather than to neurological origins. How irreversible these deficits are remain to be seen. It seems reasonable to expect, however, that early attempts to alleviate these deficits will bear fruit.³⁸

The authors go on to say that even when disabilities are neurologically related "it is likely that the behavioral deficits become exaggerated because of avoidance and can be improved through remediation."³⁹

One cannot ignore perception problems such as reversals in reading and the inability to reproduce a number sequence in arithmetic. Reading

³⁸Kirk and Kirk, p. 122.

³⁹Ibid.

and arithmetic are not unitary skills. Each necessitates the acquisition and integration of several skills that depend upon the normal functioning of a number of psychological processes including visual and auditory perception. The learning disabilities approach to remediation was adopted for this project. Each child was taught reading or arithmetic through his stronger modality as identified by the Slingerland Screening Tests and recorded in column 9 in table 6. Children who demonstrated strength in neither perceptual channel were taught through a multisensory approach. Perceptual deficits were remediated with reading or arithmetic materials rather than with adjunct perceptual materials.

Perceptual Skills Identified for Treatment

The perceptual skills which were identified for treatment are enumerated and described below:

1. Visual discrimination of structural details refers to the recognition of (matching and/or choosing) parts of words or parts of a numeral or number sentence.
2. Visual orientation of details refers to the directionality of specific numbers and letters: b, d, p, q, 4, 7, 9, 6.
3. Visual discrimination of sequence refers to the recognition of the order of letters, numbers, words, or sentences.
4. Visual figure-ground discrimination is the ability to attend to the visual stimulus object while blocking out the background.
5. Visual memory refers to the ability to recall visual stimuli.
6. Visual attention is the ability to attend to visual stimuli for a sustained period of time.
7. Visual motor ability here refers to the ability to combine visual skills with the motor skills needed to produce legible handwriting.

8. Auditory discrimination is the ability to recognize (match or differentiate) auditory stimuli.
9. Auditory synthesis refers to the ability to blend sounds to form words.
10. Auditory analysis consists of breaking down words into their component sounds.
11. Auditory figure-ground discrimination is the ability to attend to the stimulus sound and to block out extraneous sounds.
12. Auditory sequencing is the ability to recognize the order of sounds in words, words in sentences, number sequences, etc.
13. Auditory memory is the recall of auditory stimuli such as a group of spoken words or numbers.
14. Auditory attention is the ability to attend to the auditory stimuli for a sustained period of time.

The list of perceptual behaviors is selective and includes only those which appear to be closely associated with the skills of reading and arithmetic. All can be sampled with one or more of the subtests of the Slingerland Screening Tests. Not included are perceptual motor skills such as walking a balance beam, catching a ball, or responding to "Simon says" directions. Teachers were given training in the recognition of symptoms which suggest problems in other perceptual areas. They were given guidelines for referring those problems to the proper agents for further evaluation and treatment.

The perceptual behaviors were translated into terminal objectives. The perception objectives used in this project are enumerated on the next two pages. They are included in appendix 2 for easy reference.

PERCEPTION OBJECTIVES

Visual Perception

- V-1 Visual discrimination of structural details Given a visual stimulus word from a constant near point of reference, the student will identify the same word among a group of distractors.
- V-2 Visual orientation of details Given a brief exposure to a series of visual stimuli in the form of letters, numerals, words, and geometric forms from a near point, the student will write each form with the correct directionality.
- V-3 Visual discrimination of sequence Given a visual stimulus of a group of sentences from a far point of constant reference, the student will write the sentences in their correct order.
- V-4 Visual figure-ground discrimination Given a visual stimulus of a printed word or a five-digit numeral, the student will select the same word or numeral from among a group of distractors.
- V-5 Visual memory Given a brief exposure to a visual stimulus of two-, three-, four-, or five-letter words or numerals, the student will write the form with reasonable accuracy.
- V-6 Visual attention Given a visual stimulus which requires a specified period of attention which is reasonable in terms of the child's age, maturation, etc., the student will attend until the task is completed.
- V-7 Visual motor (Handwriting) Given a visual stimulus of a group of letters, words, numerals, or sentences, the student will write the stimulus forms with reasonable legibility and within a reasonable period of time.

Auditory Perception

- A-1 Auditory discrimination Given a pair of sounds auditorily, the student will tell whether they are the same or different.
- A-2 Auditory synthesis Given phonemic elements auditorily, the student will combine the phonemes to make a word or a nonword.
- A-3 Auditory analysis Given a spoken word, the student will identify initial, final, and medial phonemes.
- A-4 Auditory figure-ground Given an auditory stimulus against a background of sound, the student will make the appropriate verbal or written response.
- A-5 Auditory sequencing Given a sequence of auditory stimuli, the student will make the appropriate verbal or written response.

- A-6 Auditory memory Given an auditory stimulus, the student will demonstrate auditory memory by repeating the stimulus item or by writing an appropriate response.
- A-7 Auditory attention Given auditory stimuli requiring a reasonable period of attention, the student will attend until the task is completed.

Reasonable in the above objectives means appropriate for the individual when age, maturation, and other factors which affect learning are taken into consideration.

CHAPTER VI

PROCESS GOALS IN THE PROJECT

The processes for integrating perception with remedial reading and remedial arithmetic instruction had two major thrusts:

1. Matching instruction to each student's stronger perceptual modality and remediating perceptual deficits.
2. Training teachers to identify, evaluate, and remediate perceptual deficits.

Process Objectives

Five process objectives were identified for the perception project. Each was stated as an expected behavior. The text that follows describes how each objective was accomplished.

Process Objective 1. Given time out of the regular classroom, each student will receive individualized reading or arithmetic instruction which takes into account his perceptual modality, entry level, intelligence, and other factors which affect learning.

Students were given remedial reading or arithmetic instruction for two periods per week for the 1978-1979 school year. With the incidence of holidays, snow days, school closing, absences, and so on, each child had 50 to 60 sessions of a possible 68. A few students who had instruction for only one period per week had half as many sessions. Instructional strategies and materials were deliberately matched to each child's stronger perceptual modality and to his achievement entry level. A multisensory approach was used with students who demonstrated weakness in both areas--

visual and auditory. Each child's modality had been identified by the Slingerland Screening Tests and is recorded in column 9, table 6.

Achievement levels are shown as pretest scores in column 7. Each student's contract listed the objectives that would be treated in reading or arithmetic and the materials or strategies that would be used to remediate the instructional objectives. The contract provided an on-going record of the child's use of appropriate modality-based materials. A sample contract is shown in figure 3.

Process Objective 2. Given a diagnostic assessment, each student will receive reading or arithmetic instruction in terms of specific objectives that were identified in the diagnosis.

Each student's needs were identified with criterion-referenced tests administered in September 1978. Instruction was targeted to the specific objectives identified for each child. Reading and arithmetic objectives were written into the IIP which was reviewed by the classroom teacher or by the school principal. Progress on each instructional objective was evaluated according to the criteria set forth on the IIP. A sample IIP is shown in figure 4.

Process Objective 3. Given a diagnostic assessment, each student will receive perceptual training for the perceptual deficits that were identified in the diagnosis.

Perception objectives listed in column 12, table 6, were written into each child's IIP. One-fifth of the student's instructional time was used for perception training with appropriate reading or arithmetic materials. Deficits in visual perception were remediated with materials such as flashcards, visual tracking materials, guided readers, math pacers, workbook exercises, and paper-and-pencil activities. Deficits in auditory perception were remediated with materials such as tape recorded lessons, the Language

SRA CRITERION REFERENCED PROGRAM

OBJECTIVES AND MATERIALS

SOBAR READING

Pupil's Name JeffSchool St. Mary'sLevel E

Figure 3. The student's contract shows objectives and materials.

OBJECTIVE (Learner will identify) Obj. Cat. No. Dia. Probe No.	Pre- Date	MATERIALS						COMMENTS
		Date	Date	Date	Date	Date	Date	
1. Meaning of Suffixed Word in a Sentence IC8 RA16 RB7								Very well done
② Prefix of a Prefixed Word IC10 RA16		Building Rdy. Power Kit S.A. (BK. 1)	Specific Skills Working With Sounds (E) 32-43	Rdy. Skills Practice Kit D13-14	Practice Pad Orange pp. 28-29			
3. Meaning of Prefixed Word in a Sentence IC12 RA16 RB7								
④ Comparative Form to Complete a Sentence IC25 RA15 RB6		English Text from Class	Teacher- made Worksheets	Company Dittos (if needed)				Good work!
⑤ Superlative Form to Complete a Sentence IC26 RA15 RB6		English Text from Class	Worksheets	Company Dittos (if needed)				
6. Verb Form Used Correctly in Sentences IC31 RA15 RB6								
⑦ Verb for Subject-Verb Agreement IC32		Troubleshooter I BK. 3 pp. 1-15	English Text from Class	Teacher made Worksheets				
⑧ Syllabication of a Word IC39 RA17 RB8		Troubleshooter I BK. 4 17-30	Prescriptive Materials #38 & 39	Rdy. Skills Practice Kit D3-7	Practice Pad Orange pp. 10, 11, 45, 46, 47			
⑨ Synonym for a Word ID1 RA30 RB23		Troubleshooter I BK. 5 pp. 33-43	M.B. Synonym Bingo Game	Rdy. Skills Practice Kit B5-111				

INDIVIDUALIZED INSTRUCTIONAL MATH/READING PROGRAM

ALLEGHENY INTERMEDIATE UNIT #3
NON-PUBLIC SCHOOLS PROGRAM

Instructional Area Reading Student's Name Jeff School Year 1978-1979

Annual Goal Given a word recognition or word-study exercise at his instructional level, Jeff will identify:

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
Prefix of a prefixed word	Phonics We Use D, 2 pages on two different days.	90% average on both pages	Completed 10-9-78
Comparative form to complete a sentence	Phonics We Use D, 2 pages; two days	90% average on both pages	Completed 10-23-78
Verb for subject-verb agreement	Teacher worksheets 78,79,80 on three different days.	90% average on three pages	Completed 11-13-78
Syllabication of a word	Spelling list for three consecutive weeks	90% average on three lists	In process
Synonym for a word	Trouble Shooter 1, Book 5, pp. 40-43 on three different days	90% average on three pages	Completed 12-11-78

Annual Goal Given a passage of connected prose reading at his independent level, Jeff will identify:

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
The main idea of the selection	Barnell Loft, Level D, Lessons 18-20	90% average of the three	In process
Sequence of main events	No flashbacks. Skill Builder 5-2 Dr. Brazil, p. 116; (He Changed, p. 78)	All correct or 90% average if both are used.	In process
Cause and Effect	Skill Builder 5-2, The North, p. 104.	80%	Not introduced
Author's purpose	New Skill Builder 5-1, Sixteen Sticks, p. 87; New World, p. 52; First Farmer, p. 31	Correctly identify author's purpose in two of the three stories	Not introduced

Figure 4. An IIP for a child in the remedial reading program.

Master, exercises in auditory analysis and auditory synthesis, listening activities, and so on. Because of the impact of teacher expectation upon children's performance, students were told that the exercises were intended to correct perceptual deficits as well as provide practice in reading or arithmetic skills.

Process Objective 4. Given training in the identification, evaluation, and remediation of perceptual deficits, teachers will provide perceptual training for children whose perceptual deficits have been identified.

The teachers' in-service training program consisted of six workshops, consultation with an LD supervisor, and clinical supervision. The content of the training program is described in chapter 8.

Ten teachers volunteered to participate in the project. Each teacher worked with children from two schools. The schools chosen were those whose principals had asked for help in perception or those where several children had already been identified as perceptually impaired. The teachers and their schools are listed in appendix 1.

Given each student's perceptual needs as perception objectives (column 12, table 6), each teacher was expected to exhibit teaching behaviors which demonstrated that he or she was providing perceptual training for each student. Each teacher had at least two clinical observations. During the observations, the supervisor recorded what the children and the teacher were doing. The Student Observation Form in figure 5 was used to record data. The amount of time spent on perception training was tabulated. Perception training included intervention by the teacher and the pupil's independent interaction with instructional materials that had been identified as appropriate training activities. Process objective 4 would be met when

STUDENT OBSERVATION FORM
INDIVIDUALIZED INSTRUCTION

Subject _____ Location _____
Date _____ Time _____ Observer _____

	1	2	3	4	5	6	7	8	9	10	Sun	1
I. Independent Work												
A. Student is reading independently.												
B. Student is working on work sheet.												
C. Student is listening to a tape.												
D. Student is viewing a film strip or a viewer.												
E. Student is using language master.												
F. Student is using Flash-X.												
G. Student is using a pacer.												
H. Student is using perception materials.												
I. Student is working with kit cards.												
J. Student is taking a test.												
K. Student is checking his work.												
L. Student is making corrections.												
M. Miscellaneous												
II. Teacher-Pupil Work One-to-One												
A. Pupil seeks help from teacher.												
B. Pupil receives help from teacher.												
C. Pupil discusses work with teacher.												
D. Teacher initiates intervention.												
E. Teacher gives perceptual training.												
F. Teacher tells directions to pupil.												
G. Teacher reads directions to pupil.												
H. Teacher checks pupil's work.												
III. Non-Instructional Use of Pupil Time												
A. Pupil at desk not working.												
B. Pupil waits for teacher.												
C. Pupil waits for materials.												
D. Pupil gets materials.												
E. Pupil talks to other pupils.												
F. Miscellaneous												
IV. Pupil-Pupil Activity												
A. Pupil asks help from pupil.												
B. Pupil receives help from pupil.												
C. Pupils engage in cooperative task.												
V. Group Activity												
A. Pupil contributes to discussion.												
B. Pupil answers a question.												
C. Pupil asks a question.												
D. Pupil takes a group test.												
E. Pupil listens to tape with group.												
F. Pupil watches film with group.												
G. Pupil listens to teacher lecture or demonstrate.												
H. Pupil receives group perception training.												
I. Pupil watches performance with group.												
J. Miscellaneous												
Totals												

*Adapted from IPI Student Observational Form by Lindvall reported in Anita Simon and E. G. Royer, *Mirrors for Behavior: An Anthology of Classroom Observation, Research for Better Schools*, Philadelphia, 1967.

Figure 5. Student observation form.

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all teachers were using one-fifth of total pupil time for perceptual activities as indicated on the student observation form.

Process Objective 5. Given the content of the in-service workshops and other resources needed to support a program of perception, the supervisor with the staff will produce a document that contains a record of the products and processes of the project and a handbook for the teachers.

The handbook would serve as a resource for the staff. The report and the teacher's handbook combined would constitute an exportable model that could be used by other program planners. The project was expected to generate a body of tangible materials and a set of processes which would be documented. Activities related to the development and implementation of the program were documented in a journal kept by the supervisor of remedial services. The journal entries, workshop content, and resources for the teachers were assembled by the supervisor during the progress of the project. Teachers, meanwhile, accumulated a body of experiences and materials from the workshops.

The participating teachers were to evaluate the handbook with the Checklist of Criteria for Evaluating Handbook, figure 6, at the June evaluation workshop. Dr. Melvin Samuels, Director of Division I, Allegheny Intermediate Unit, would evaluate the handbook and the final report. To be acceptable, the handbook had to get ratings of "very good" or "excellent" on 90 percent of the checklist items that referred directly to it (all except #1). The report had to earn at least a "very good" (item #1) to be considered acceptable. That is, the report had to be comprehensive enough to permit replication of the project.

CHECKLIST OF CRITERIA FOR EVALUATING HANDBOOK

KEY

- 1 Poor
2 Fair
3 Good
4 Very Good
5 Excellent

Rate each item on a scale of 1 to 5.

- | | | | | | |
|--|---|---|---|---|---|
| 1. The report of the process is comprehensive enough to permit replication of the project. | 1 | 2 | 3 | 4 | 5 |
| 2. The process and product of each workshop session are sufficiently reported to allow replication of each workshop. | 1 | 2 | 3 | 4 | 5 |
| 3. The handbook lists the fourteen perceptual areas treated and provides a definition of each. | 1 | 2 | 3 | 4 | 5 |
| 4. The handbook contains a checklist of traits for identifying children for perceptual testing. | 1 | 2 | 3 | 4 | 5 |
| 5. The handbook provides strategies for identifying a child's learning modality. | 1 | 2 | 3 | 4 | 5 |
| 6. The handbook presents the rationale for using reading and arithmetic materials for the remediation of perceptual deficits. | 1 | 2 | 3 | 4 | 5 |
| 7. The handbook contains specific perception activities for the remediation of each of the fourteen perceptual deficits. | 1 | 2 | 3 | 4 | 5 |
| 8. The handbook contains specific activities which use <u>reading</u> materials for the treatment of perceptual deficits. | 1 | 2 | 3 | 4 | 5 |
| 9. The handbook contains specific activities which use <u>arithmetic</u> materials for the treatment of perceptual deficits. | 1 | 2 | 3 | 4 | 5 |
| 10. More than 90 percent of the perception activities involve materials that are clearly either reading or arithmetic materials. | 1 | 2 | 3 | 4 | 5 |
| 11. The handbook includes techniques and materials that can be used to remediate perceptual deficits in addition to those techniques presented in the workshops. | 1 | 2 | 3 | 4 | 5 |
| 12. The handbook lists instruments for assessing perceptual strengths and weaknesses in addition to those instruments used in the project. | 1 | 2 | 3 | 4 | 5 |

To be acceptable, the handbook must have a rating of 4 or 5 on 90 percent of the items.

Figure 6. Checklist of criteria for evaluating handbook.

The project processes were evaluated through open discussion at the evaluation meeting in June 1979. Each process objective was discussed in its turn. The outcome of the evaluation is included in chapter 9, Evaluation.

CHAPTER VII

DEVELOPING THE PROGRAM

Planning for the perception program began with the teachers' request for an in-service training program that would enable them to respond to the perception problems which they were encountering. The request was made during the June 1, 1978 evaluation meeting. On the following Monday (June 6, 1978) a committee of six remedial teachers met to identify the perceptual skills that would be included in the program and to put together a set of guidelines that the teachers could use as a reference as the program evolved. Working on the guidelines were the two teachers who had the competencies needed to treat perceptual deficits and four teachers who wanted to include perceptual training in their remedial instruction. A ten page document entitled Guidelines for the Identification and Amelioration of Problems in Perception in Reading and Mathematics was produced. The guidelines are incorporated in the handbook in appendix 6.

Resources needed for the development and implementation of the project were secured during the summer. Materials were ordered. The guidelines were reproduced. The supervisor of remedial services and the learning disabilities supervisor, Lucille Naughton,⁴⁰ planned the content and sequence

⁴⁰At that time, Mrs. Naughton served as LD consultant to the Catholic Diocese of Greater Pittsburgh, supervised teachers in the Exceptional Childrens Program, and provided diagnostic-prescriptive service to children in the Non-Public Schools Program.

of the series of perception workshops which would facilitate the implementation of the program. Meeting sites and dates were obtained. All of the workshops were scheduled into either the Resources Center or the Conference Room at the intermediate unit.

Resources Used in the Program

Some of the resources were already built into the program. Mrs. Naughton, for example, supervised the learning disabilities services in the Non-Public Schools Program. As such, her services were acquired at no additional cost to the remedial program. Typing was done by the girls in Word Processing at no charge to the remedial program. Space for the workshops and the evaluation meeting was available at the AIU at no charge beyond the department's cost of space for monthly meetings. The six half-day workshops and the evaluation meeting were part of the required monthly in-service meetings which were included in the teachers' schedules. None of the meetings required overtime or substitutes.

Money was spent for materials and printing. The Slingerland Screening Tests, Flash-X devices, Flash-X programs, and index cards for the Glass Analysis decoding program were bought. Guidelines, handouts, forms, and the perception handbook were printed by the intermediate unit Design and Print Department. Dollar costs are shown in the budget in figure 7. Other resources used are shown in figure 8.

THE BUDGET

Tests and Instructional Materials

<u>Slingerland Screening Tests and Materials</u>	\$405.05
30 Flash-X Devices @ \$10.50	315.00
30 Flash-X Programs 4.50	135.00
30 Sets Index Cards 2.50	75.00

Contracted Services

Design/Print Department	
3,000 impressions @ .019	53.20
	<u>\$983.25</u>

Figure 7. The budget shows expenditures.

OTHER RESOURCES

Services Within the Department

Services of LD Supervisor for Workshops Preparation and four half-days, 12 hours	No charge
Word Processing, Typing workshop materials and handbook components 22 hours	No charge

Staff Time

Six half-day workshops for 10 teachers	
One half-day evaluation meeting	
Budgeted as required in-service training	No charge

Facilities Needed

Meeting Sites for Workshops, 6 half-days	
Meeting Site for Evaluation meeting	No charge

Supervisor's Time

20 On-site Observations	40 hours
6 Workshops, 2 presentations	20 hours
Analysis of evaluation data	10 hours
Final report	120 hours

Figure 8. Other resources used in the project included services, time, and facilities for which there were no additional charges.

Program Development

The program was developed through a series of six half-day workshops for ten participating teachers. The first two workshops gave the teachers the means for identifying, remediating, and evaluating perceptual problems. The third workshop consisted of strategies for remediating perceptual deficits with reading and arithmetic materials. The last three workshops provided experiences which expanded each teacher's repertoire of strategies for dealing with students who exhibited perceptual deficits and poor achievement in reading or arithmetic.

The workshops were done jointly by the program supervisor and by Mrs. Lucille Naughton, Learning Disabilities Supervisor. Mrs. Naughton did the workshops on techniques for teaching perceptually handicapped children, behavior management, and dealing with the older student. The remedial supervisor provided workshop content in reading related activities and provided the resources for all of the workshops. All workshops were held at the Allegheny Intermediate Unit. Between workshops, Mrs. Naughton and the program supervisor were on call for individual consultations with the teachers in the project.

The workshop topics had been planned before the series began but were open to modification according to teachers' needs. An evaluation at the end of each workshop gave teachers an opportunity to express their needs or concerns. These comments were used to guide each subsequent workshop. The workshop topics are listed below. The content of each workshop is described in chapter 9. Workshop materials are in appendix 5.

List of Workshops

Workshop 1 October 1978	The Vocabulary of Perception
Workshop 2 November 1978	Modality and Case Studies
Workshop 3 December 1978	Remediating Reading and Arithmetic, A Modality Approach
Workshop 4 January 1979	Is It Reading or Arithmetic? Perception and the IIP
Workshop 5 February 1979	Attending Behavior and Behavior Management
Workshop 6 March 1979	The Older Student, Perception and Motivation

The sequence of events in the planning, development, and implementation of the perception component of the remedial program have been briefly described in this chapter. The timeline in figure 9 shows the sequence of events starting with the principals' request for perceptual remediation in the 1977-1978 school year and continuing through total program implementation in 1979-1980.

TIME LINE FOR PERCEPTION PROJECT

1977-1978

	Principals request perceptual remediation for remedial students.
June	AIU teachers ask for in-service training.
	Committee identifies perception areas.
	Committee produces a set of guidelines.
July	Supervisor searches literature for strategies.

1978-1979

August	Survey identifies teachers' needs. Perception workshops are planned with LD supervisor. Resources are secured.
September	Pretests are administered to remedial students. Perceptually impaired students are identified. An IIP is written for each student. An MEA level is predicted for each student.
October through March	Perception training program for teachers progresses. Six perception workshops are held. LD supervisor consults with teachers on individual cases. Remedial supervisor observes teachers' application of perceptual treatments.
May and June	Students' progress is assessed. Assessment data is collected and evaluated. Products and processes are evaluated at evaluation meeting. Recommendations are made by staff and supervisor.
July and August	Project data is analyzed by supervisor. Handbook components are refined and assembled. Recommendations are reviewed. Perception component is added to staff manual.

1979-1980

August	Perception component is implemented. New staff are oriented to perception component. Perception component is introduced to all non-public school principals at fall meetings. Final report is prepared.
--------	--

Figure 9. Time line showing sequence of events in the project.

CHAPTER VIII

IMPLEMENTING THE PROGRAM OF PERCEPTION

Project Participants

The target population consisted of one hundred children in grades 2 through 8 in 20 non-public schools. All were (1) below grade level in either reading or arithmetic, (2) had discrepancies of from .5 to 6.9 years between achievement and expectancy levels, and (3) demonstrated deficits in one or more areas of perception. Seven reading specialists and three math specialists participated in the project. The teachers and the schools are in appendix 1 under the heading of Project Participants. The students are identified by student number on the pupil data forms in table 6 on pages 31-39. They are arranged according to the number of years of school completed as of September 1978 (column 4) and the school attended (not identified on the form). The first sixty-one students were in the remedial reading program. The remaining thirty-nine were in the remedial arithmetic program.

Instructional Treatment

Treatment consisted of (1) reading or arithmetic instruction through an approach which utilized the child's perceptual modality and (2) remediation in the deficit perceptual areas. Most students were given two periods of instruction per week. With the incidence of holidays, snow days, school closing, teacher's or student's absences, each child had 55 to 60 sessions of a possible 68. The few who had instruction for one period per week had half as many sessions. Instructional strategies and materials

were deliberately matched to each child's stronger perceptual modality. A multisensory approach was used with students who demonstrated weakness in both areas--visual and auditory. The perception objectives which were written into each student's IIP were remediated with appropriated reading or arithmetic materials. The Matrix of Perception Treatments, figure 10, shows which materials were appropriate for teaching to the child's modality and which were appropriate for remediating perceptual deficits.

Perceptual Treatment

Because of the impact of teacher expectation upon children's performance, students were told the objective of each training session. According to Brophy and Good, when a teacher forms a differential expectation for a child, he treats the child according to that expectation.⁴¹ The child responds in a way that complements and reinforces the teacher's expectation. The sequence of events is a kind of self-fulfilling prophecy in that the child does what he thinks is expected of him. Informing the child of his perceptual treatment was part of the perceptual treatment. The following events were included for each child in the study group:

1. Perceptual objectives were included in the IIP.
2. The child was told that the practice or exercise was intended to improve perceptual skills as well as reading or arithmetic.
3. Practice with perception materials was consistent. At least one-fifth of every instructional period was given to perceptual training. Some practice was done independently. Some required teacher intervention.

⁴¹J. E. Brophy and T. L. Good, "Teachers' Communication of Differential Expectations for Children's Classroom Performance: Some Behavioral Data," Journal of Educational Psychology 61 (1970) pp. 365-366.

MATRIX OF PERCEPTUAL TREATMENTS

INSTRUCTIONAL MATERIALS IN THE REMEDIAL PROGRAM	TYPE OF TEACHING MATERIAL					TYPE OF PERCEPTUAL REMEDATION													
	Reading	Arithmetic	Visual	Auditory	Multisensory	V-1 Visual Discrimination	V-2 Visual Orientation	V-3 Visual Sequence	V-4 Visual Figure-Ground	V-5 Visual Memory	V-6 Visual Attention	V-7 Visual Motor-Handwriting	A-1 Auditory Discrimination	A-2 Auditory Synthesis	A-3 Auditory Analysis	A-4 Auditory Figure-Ground	A-5 Auditory Sequence	A-6 Auditory Memory	A-7 Auditory Attention
Alphabetical Order	x				x			x									x		
ASMD Worksheets		x	x			x	x		x		x	x						x	x
Arithmetic Fact Kit, SRA		x	x			x	x		x		x	x							
Auditory Analysis-Synthesis Program	x			x									x	x	x	x	x	x	x
Bingo, Word or Number	x	x			x	x	x	x	x	x	x		x			x		x	x
Bowmar Math Sheets		x	x			x	x	x	x	x	x	x						x	x
Chalkboard (lap size)	x	x	x				x	x		x	x	x							
Classmate 88		x	x			x	x	x		x	x	x							
Clues, EPC	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Comprehension Bubble, SRA	x				x	x	x	x	x	x	x	x				x	x	x	x
Computapes, SRA		x			x	x	x	x	x	x	x	x				x	x	x	x
Controlled Reader	x		x			x	x	x	x	x	x								
Crossnumber Puzzles		x	x			x	x	x	x	x	x	x							
Crossword Puzzles	x		x			x	x	x	x	x	x	x							
Cuisenaire Rods		x			x	x	x	x	x	x	x								
Dataman		x	x			x	x	x	x	x	x	x							
Dictation	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
DLM Materials	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Factpacer Device, SRA		x	x			x	x	x	x	x	x	x							
Flashcards	x	x	x			x	x			x	x								
Flash-X Device, EDL	x	x	x			x	x	x	x	x	x	x	x						
Flowchart	x		x			x	x		x	x	x	x							
Glass-Analy:is Decoding	x				x	x	x	x	x	x	x		x	x	x	x	x	x	x
ICSP Math		x	x			x	x	x	x	x	x	x							
ICT Guided Feading	x				x	x	x	x	x	x	x	x				x	x	x	x
Language Master	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Figure 10. Matrix of perceptual treatments.

INSTRUCTIONAL MATERIALS IN THE REMEDIAL PROGRAM	TYPE OF TEACHING MATERIAL					TYPE OF PERCEPTUAL REMEDATION													
	Reading	Arithmetic	Visual	Auditory	Multisensory	A-1 Visual Discrimination	A-2 Visual Orientation	V-3 Visual Sequence	V-4 Visual Figure-Ground	V-5 Visual Memory	V-6 Visual Attention	V-7 Visual Motor, Handwriting	A-1 Auditory Discrimination	A-2 Auditory Synthesis	A-3 Auditory Analysis	A-4 Auditory Figure-Ground	A-5 Auditory Sequence	A-6 Auditory Memory	A-7 Auditory Attention
Listening Skill Builder	x			x									x			x	x	x	x
Map Study Skills	x		x			x	x		x		x	x							
Math-A-Dot		x	x			x	x	x	x	x	x	x							
Mathematics Drillpak, SRA		x	x			x	x	x	x	x	x	x							
Math MiniSystems, Coronet		x			x	x	x	x	x	x	x	x	x			x	x	x	x
McCall Crabbs Test Lesson	x		x			x	x	x	x	x	x								
Merrill Skill Tapes		x			x	x	x	x	x	x	x	x	x			x	x	x	x
Michigan Tracking	x	x	x			x	x	x	x	x	x	x	x						
Number Line		x	x			x	x	x	x	x	x	x							
Phonics Bubble, SRA	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Read-Along Books	x				x	x	x	x	x	x	x		x			x	x	x	x
Reader's Digest Tutors	x				x	x	x	x	x	x	x	x	x			x	x	x	x
Reading for Understanding	x		x			x	x	x	x	x	x	x							
Scholastic Math Program		x		x		x	x	x	x	x	x	x	x			x	x	x	x
Schoolhouse Comprehension	x		x			x	x	x	x	x	x	x							
Schoolhouse Mathematics		x	x			x	x	x	x	x	x	x							
Schoolhouse Word Attack	x		x			x	x	x	x	x	x	x							
Scope Visuals	x		x			x	x	x	x	x	x	x							
Scrambled Sentences	x		x			x	x	x	x	x	x	x							
Skill through Patterns		x	x			x	x	x	x	x	x	x							
Spill and Spell	x				x	x	x	x	x	x	x		x	x	x	x	x	x	x
Structural Analy. Bubble	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
System 80	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Each student was pre-tested with a norm-referenced reading or arithmetic achievement test to establish his or her entry level. A criterion-referenced test provided diagnostic information about each child's strengths and needs in reading or arithmetic. All students, even those who had had outside evaluations, were given the Slingerland Screening Tests as a perception pretest.

A math or reading expectancy and a deficit were calculated for each child. Given the student's learning capacity, pretest score, factors which impede or facilitate instruction, and periods of instruction per week, the teacher computed a modified expected achievement level for each child. In addition, each teacher predicted a perception posttest score. Criterion levels of mastery for instructional objectives and for perception objectives were set for each child. All of the data were recorded on the pupil data sheets on pages 31-39. The key on pages 29-30 explains the content of each column.

Supervisor Observes as Teachers Implement Skills

The remedial supervisor encouraged the integration of the perception program into the remedial program through consultation and clinical supervision. In addition to the informal visits from the supervisor and from Mrs. Naughton, each teacher had at least two clinical observations where the supervisor's objective was to observe the extent to which the workshop content was implemented. The Student Observation Form shown as figure 11 on the next page was adopted from Lindvall's IPI Student Observational Form reported in Simon and Boyer's Mirrors for Behavior⁴² to record the use of perceptual training in each mobile classroom.

⁴² Anita Simon and E.G. Boyer, Mirrors for Behavior: An Anthology of Classroom Behavior, (Research for Better Schools: Philadelphia 1967).

STUDENT OBSERVATION FORM
INDIVIDUALIZED INSTRUCTION

Subject

Arithmetic

Location

St. Gabriel, Tex

Date

Time *10:10-10:30*

Observer

	1	2	3	4	5	6	7	8	9	10	SUM	%
I. Independent Work												
A. Student is reading independently.												
B. Student is working on work sheet.	11	11	11	1	1		11	11	11	11	16	40
C. Student is listening to a tape.												
D. Student is viewing a film strip or a viewer.												
E. Student is using language master.												
F. Student is using Flash-X. <i>Percep.</i>	1	1	1	1					1	1	6	15
G. Student is using a pacer. <i>Percep.</i>									1	1	2	5
H. Student is using perception materials.												
I. Student is working with kit cards.	1	1	1	1	1	1	1				7	17.5
J. Student is taking a test.												
K. Student is checking his work.						1					1	2.5
L. Student is making corrections.												
M. Miscellaneous												
II. Teacher-Pupil Work One-to-One												
A. Pupil seeks help from teacher.				1							1	2.5
B. Pupil receives help from teacher.					1	1					2	5
C. Pupil discusses work with teacher.												
D. Teacher initiates intervention.												
E. Teacher gives perceptual training.												
F. Teacher tells directions to pupil.												
G. Teacher reads directions to pupil.												
H. Teacher checks pupil's work.								1			1	2.5
III. Non-Instructional Use of Pupil Time												
A. Pupil at desk not working.												
B. Pupil waits for teacher.								1			1	2.5
C. Pupil waits for materials.												
D. Pupil gets materials.						1	1				2	5
E. Pupil talks to other pupils.												
F. Miscellaneous <i>Puts away materials</i>					1						1	2.5
IV. Pupil-Pupil Activity												
A. Pupil asks help from pupil.												
B. Pupil receives help from pupil.												
C. Pupils engage in cooperative task.												
V. Group Activity												
A. Pupil contributes to discussion.												
B. Pupil answers a question.												
C. Pupil asks a question.												
D. Pupil takes a group test.												
E. Pupil listens to tape with group.												
F. Pupil watches film with group.												
G. Pupil listens to teacher lecture or demonstrate.												
H. Pupil receives group perception training.												
I. Pupil watches performance with group.												
J. Miscellaneous												
Totals	4	4	4	4	4	4	4	4	4	4	40	100

Figure 11. Student observation form with markings.

Student Observation Form

The student observation form gives the observer objective data about the pupils' use of time. The form lists thirty-seven specific activities (not including miscellaneous) grouped into five categories; independent work, teacher-pupil work one-to-one, non-instructional use of pupil time, pupil-pupil activity, and group activity. Within the various categories are three kinds of perceptual activity; student is using perceptual materials, teacher gives perceptual training, and pupil receives group perception training. The language master, the Flash-X, the pacer, various kits, cassette tapes, and worksheets are often used for perceptual training. When used for this purpose, the symbol percep is noted next to the time so that the time spent in perceptual training can be objectively recorded.

Before recording on the form, the observer spends a few minutes becoming oriented to the students' activities, the classroom arrangement and the materials. This is done without interrupting classroom activities. Since each child has an individualized program, the observer can expect to see each child working at something different.

The observer records pupil activity every two minutes for a total of twenty minutes. Each column on the form represents two minutes of time. During the first two minutes, the observer puts a mark in column 1 for each pupil in the room. Each mark is placed on the line that best describes what a child is doing. During the next two minutes, the observer makes a mark in column 2 on the lines that best describe what each pupil is doing. One mark is made for each child during each two minute period for a total of twenty minutes.

The marks are tallied vertically and horizontally. In figure 11. four children were observed. Each column contains four marks. Horizontal tallies are converted to percentages. Tallies show that 40 percent of the pupils' time was spent on worksheets, 15 percent on the Flash-X, 5 percent on the pacer, and 17.5 percent on kit cards. It is easy to see that 20 percent of that twenty minute segment of instructional time was spent on perception activities (Flash-X and pacer).

Teachers' Application of Workshop Content

Program implementation occurred at different rates for different teachers. Two teachers were able to teach to each child's modality and to remediate deficit areas at the outset. They had the skills. The remaining eight progressed at various rates. The first workshop gave every teacher the vocabulary for identifying perceptual deficits and introduced the Slingerland Screening Tests for evaluating children's perceptual skills. As a consequence of the first workshop, students in the study group were administered the Slingerland which not only identified perceptual deficits but also identified each child's modality.

The second workshop gave the teachers an opportunity to discuss several case studies. The discussion provided many ideas for teaching to the modality and remediating perceptual deficits.

The third workshop introduced a program of perceptual conditioning for children who needed to develop skill in word recognition. Specific strategies for auditory analysis and auditory synthesis were described and practiced by the teachers. A film was used to develop teachers' skill in using Cuisenaire rods to develop math concepts through a multisensory approach. Teachers had hands-on experiences with all of the materials.

By December, the teachers had had three workshops which gave them enough background to enable them to identify, evaluate and remediate perceptual deficits. During this period, each teacher had a clinical observation. The supervisor recorded the teacher's use of perceptual training on the Student Observation Form. Only two of the teachers were using perceptual training. The tallies on the form showed that the children were receiving perceptual stimulation. For the activity to be considered perceptual training, the child had to be informed that he or she was receiving perceptual training.

The supervisor elicited from each teacher a commitment to include perceptual training on the IIP and on the contract for every child in the study group. Since the IIP was to be reviewed by the principal and the child's classroom teacher, it had to be written according to diagnostic-prescriptive guidelines. Adding perceptual training to the child's contract was a simpler matter. If a prescribed reading or arithmetic material (already listed on the child's contract) was to be used to remediate a perception objective, the number of the perception objective was noted beside the instructional material on the child's contract. The child soon learned that V-5 written beside Flashcards--Set 16 meant that the flashcard drill would improve visual memory.

After the first of the year, students' awareness of perceptual training increased noticeably. Students were asking, "Is this for perception or is it for math?" "Will my auditory analysis get better if I do this tape?"

The latter three workshops expanded upon concepts introduced at earlier sessions. Teachers voiced concerns about students' lack of

motivation--often a manifestation of perceptual deficits. How to motivate the severely disabled, how to teach the child with severe deficits, and treatments for older children were persistent concerns for several teachers. The last two workshops addressed behavior modification and the problems of older students.

Eight teachers requested and received individual consultations with the learning disabilities supervisor or with the remedial supervisor during the months of January, February, and March. Clinical observations made during this period showed an increase in the application of perceptual training.

CHAPTER IX

CONTENT OF WORKSHOPS IN THE TEACHERS' IN-SERVICE TRAINING PROGRAM

Six workshops were planned to develop the teachers' competencies in teaching to the child's stronger modality and remediating deficit perception areas. Planned jointly by the supervisor of remedial services and the supervisor of learning disabilities services, the workshops gave the teachers first-hand experiences in identifying perceptual strengths and weaknesses. Teachers learned how to apply some new materials as well some new applications for old materials. All workshops were held at the Allegheny Intermediate Unit Resources Center or in the Conference Room. The workshops were attended by the ten teachers who were participating in the perception project as well as the other 18 teachers on the remedial staff. Two workshops were conducted by the remedial supervisor; four were led by the learning disabilities supervisor. The remedial supervisor opened each session with a brief overview of the workshop agenda. Each session ended with a wrap-up or summary of the workshop content and a written evaluation of the event.

All agendas, workshop handouts, and evaluation forms are included in appendix 5. Materials are assembled in the order of their use in the workshop. The first item in appendix 5 is the workshop schedule. The rest of the materials are included according to the workshop in which they were used.

Workshop 1. The Vocabulary of Perception

The supervisor of remedial services conducted the first perception workshop in the AIU Resources Center. The workshop was designed to:

1. Introduce the teachers to the vocabulary of perception.
2. Identify behaviors which indicate deficits in visual and auditory perception (the Slingerland Screening Tests).
3. Involve the teachers in identifying among their teaching materials those that could be used to remediate perceptual deficits.

The perception skills that had been identified for the project are listed below and are briefly described in the List of Pre-requisite Skills for Reading and Arithmetic included in the workshop materials in appendix 5.

The following thirteen terms were introduced:

1. Visual discrimination of structural detail
2. Visual discrimination of orientation
3. Visual discrimination of sequence
4. Visual memory
5. Visual figure-ground discrimination
6. Visual attention
7. Auditory discrimination
8. Auditory analysis
9. Auditory synthesis
10. Auditory sequence
11. Auditory memory
12. Auditory figure-ground discrimination
13. Auditory attention

Each term was discussed. Examples of each perceptual behavior were elicited from the teachers. In a series of three written exercises in Skills in Visual and Auditory Perception, the teachers practiced using the terms. They worked through the self-directing exercises in pairs. Each had a key for self-checking. Differences of opinion were aired during the discussion that followed.

In the second workshop event, teachers divided into two groups, auditory and visual, to identify the instructional materials and teaching techniques that could be used to remediate deficits in auditory and visual skills. A recorder for each group listed the materials. Materials and techniques were matched with the perception skills on the worksheets included in the workshop materials. The outcome of the exercise was duplicated on a nearby copier and distributed on site.

In the third workshop event, Cynthia Rush, a reading specialist in the program, demonstrated the use of the Slingerland Screening Tests for identifying perceptual deficits and the child's stronger perceptual modality. The teachers were walked through part of each subtest. Mrs. Rush explained the perception skills that each subtest sampled, discussed scoring, and interpreted a set of test scores. The terminology of the test closely matched the terms which had already been introduced.

Evaluation notes indicated that all workshop objectives were met. All of the teachers said they could immediately apply the workshop content the next day. Half of the teachers said they did not realize that the techniques which they were using to teach reading and math skills were effective in remediating perceptual deficits. When asked what else they

needed in the area of perception, teachers listed the following needs:

1. How to recognize perceptual problems without testing.
2. How to teach children with severe deficits.
3. More specific activities for teaching to the child's modality.

Other needs for future in-service sessions listed by two or more teachers included:

1. Dealing with the problems of specific children
2. Writing IIPs for perception
3. Workshops by LD specialists
4. Motivating the slow learner
5. Meeting the specialized personnel (the school psychologist, LD specialists, etc.)

Workshop 1 handouts included in appendix 5:

Agenda, Workshop 1

Prerequisite Skills for Reading and Math

Skills in Visual and Auditory Perception, Exercise 1

Skills in Visual Perception, Exercise 2

Skills in Auditory Perception, Exercise 3

KEY, Skills in Visual and Auditory Perception

Visual Perception Worksheet

Auditory Perception Worksheet

Evaluation, Workshop 1

Workshop 2. Modality and Case Studies

The second workshop was held in the AIU Resources Center and was attended by all ten participating teachers. The content was directed to the needs expressed in the evaluation of the first session. How to recognize the child's modality and how to direct instruction to it appeared to be major concerns.

Modality in the literature of remediation refers to the child's sensory channel through which information is processed most efficiently. The most important are visual, auditory, and kinesthetic. When two or more channels are equally efficient, we say the child has a mixed modality. Some children, however, show strength in neither modality. They are perceptually impaired. Given instruction by Mrs. Naughton, Learning Disabilities Specialist, the teachers were expected to:

1. Identify the modality of a given child.
2. Identify strategies for teaching reading or arithmetic to the child's stronger modality.

After the first session, the supervisor sent the teachers a memo asking them to prepare an abbreviated case-study of one of their most difficult students in preparation for the second workshop. The abbreviated case-study consisted of data which included reading or arithmetic pretest scores, results of the Slingerland, and "problem behaviors" observed by the teacher. Problem behaviors included (1) what the child did or (2) what the child did not do in reading or arithmetic. The case-study was brought to the second workshop. Each student's name was changed to insure confidentiality.

The first part of the session consisted of a 60 minute presentation on how to identify the visual learner and the auditory learner. Mrs. Naughton's outline, Observation Pointers to Learner Types and Adjustment Techniques, is in appendix 5.

During the second part of the workshop, teachers discussed the case studies which they brought to the meeting. The objective of this session was to identify the child's modality. Teachers divided into groups of three. Each case-study was read within the small group. Teachers pooled their skills to identify each child's modality and to find ways to teach reading or arithmetic through that modality. They used the modality form in appendix 5 for recording their suggestions for each child. Mrs. Naughton and the program supervisor responded to questions and concerns within the small groups. Each small group selected one case study for presentation to the whole group. The spokesperson for each small group (1) summarized the case-study data, (2) identified the child's modality as visual, auditory, mixed, or neither, and (3) enumerated the strategies that were suggested for remediation. Mrs. Naughton summarized each of the presentations. The case study review took little more than an hour including directions from Mrs. Naughton (5 minutes), small group discussion (30 minutes), presentations to the whole group (25 minutes) and a summary by Mrs. Naughton (5 minutes).

Workshop content was evaluated in terms of the workshop objectives. Teachers' showed that both objectives had been met. Three teachers mentioned that they were more confident about identifying perceptual deficits. All made positive statements about having additional prescriptive information for a child with learning problems.

Other needs for future workshops mentioned by two or more teachers and listed in order of frequency included:

1. More techniques for remediating deficits.
2. Writing IIPs for perception.
3. Motivating slow learners.
4. How to remediate severe deficits.

Workshop 2 handouts included in appendix 5:

Agenda, Workshop 2

Observation Pointers to Learner Types and Adjustment Techniques

Modality Prescription Form

Evaluation, Workshop 2

Workshop 3. Remediating Reading and Math Deficits:
A Modality Approach

The third workshop was conducted by the remedial supervisor at the AIU Resources Center. All participating teachers attended. Presentations consisted of a modality approach to reading and math instruction.

Objectives of the workshop were:

1. To give teachers hands-on experiences in matching instruction to the students' modality.
2. To give teachers hands-on experiences with materials that could be used to remediate perceptual deficits.

The remedial supervisor discussed and demonstrated Gerald G. Glass' strategy for teaching word recognition to visual learners or to children who cannot discriminate vowel sounds. Gerald G. Glass' perceptual conditioning is a program for teaching children to recognize clusters of letters

rather than single letters as elements of words. When learning to recognize new words, the child sees the visual stimulus, hears the sounds associated with the visual stimulus, and responds verbally. Practice is visual, auditory, and verbal. Teachers practiced using the technique with each other. Appendix 5 includes a copy of the rationale for the Glass Analysis technique as well as directions for using the procedure.

The program of Auditory Analysis and Synthesis developed by Jerome Rosner was demonstrated. It is used with auditory learners or with children who have difficulty dividing words into phonemes and/or combining sounds to synthesize words. The program for auditory analysis and synthesis is included in appendix 5.

The film "Mathematics at Your Fingertips" (National Film Board of Canada, 28 min., color) was used to show how children learn simple mathematical relationships and advance more easily to abstract concepts by using sets of colored sticks and the system developed by George Cuisenaire. Teachers had experiences with the Cuisenaire rods.

The Flash-X was demonstrated as a device for improving visual skills in arithmetic (and reading) and for providing another kind of math practice for the visual learner. Each teacher was given a Flash-X device and practice materials to use on site.

How to use a tape recorder to provide another kind of arithmetic practice for the auditory learner was described by the supervisor. Teachers suggested other applications. Presenter's suggestions are listed on the next page.

1. Record multiplication table. Tape says the facts. Child writes the answers only. Tape checks his answers.
2. Put story problems on tape. Child reads problem visually while listening to tape. Child uses two senses.
3. Tape record instructions to the child. Put tape cassette in child's folder. All directions are on the cassette. Begin with very simple directions such as "Add all of the problems on worksheet #1. When you are finished show your work to your teacher."
4. This helps the child who has trouble concentrating on story problems. Child reads his story problem into tape recorder. When he plays it back, he receives input through two channels. (Works only with the child who has no problems with word recognition or with fluency.)

Evaluation showed that all presentations were appropriate for immediate application. The following comments were made by two or more of the ten teachers:

1. Teachers had heard about the perceptual conditioning technique but had never seen it demonstrated. They said it looked promising.
2. Auditory analysis and synthesis activities were good follow-up to the auditory analysis test. Reading specialists had used the test but had never had access to the training techniques.
3. The Cuisenaire film opened up an array of tactile-visual-verbal activities for developing math relationships.
4. The Flash-X was welcomed for training in visual attention, visual discrimination.
5. Tape recorders are already much used by children. Will need another tape-recorder per van if we incorporate these suggestions.

Future concerns included amount of time that might be "lost" as teachers apply perceptual training techniques. Motivation continued to be a pressing concern.

Workshop 3 handouts included in appendix 5:

Agenda, Workshop 3

General Information--Glass-Analysis Program

It's Really Very Simple

Decoding Ability Screening Test

Teaching Decoding: Glass Analysis for Perceptual Conditioning

Easier Kit Word List

Medium Kit Word List

Harder Kit Word List

Student's Record Sheet for Word Analysis A

Student's Record Sheet for Word Analysis B

Auditory Analysis Training Objectives, Levels A-J

Auditory Analysis Training Activities

Evaluation, Workshop 3

Workshop 4. Is It Reading or Arithmetic?
Perception and the IIP

The fourth workshop was held in the AIU Conference Center. All ten perception project teachers and the remaining 18 remedial staff attended. The objectives of the workshop were:

1. To identify ways to remediate students' inability to solve word problems in arithmetic.
2. To integrate perceptual training into arithmetic or reading instruction.
3. To establish guidelines for writing perception IIPs.

The learning disabilities supervisor led the first part of the workshop. Students who appear to have adequate reading skill often have difficulty with reading and solving arithmetic word problems. The first step is to determine whether or not the child can readily read all of the words in the problem. If word recognition is not a problem, the teacher must use the student's stronger modality in teaching problem solving. The LD supervisor's discussion centered on (1) how to teach the vocabulary of arithmetic and (2) how to develop skill in solving word problems. Many of the remedial techniques for teaching arithmetic-reading paralleled those in the Cassidy-Sharkey article included in appendix 5.

A discussion of who should remediate the child's difficulty with word problems was resolved this way. Analyze the child's behavior. Does he have trouble with word recognition or does he have trouble with the math process? If the child has one remedial teacher, reading or arithmetic, it is the responsibility of that teacher to treat whatever aspect of the word problem is giving the child difficulty. If the child has remedial instruction in both reading and arithmetic, both remedial teachers should

analyze his difficulty and plan together to remediate the arithmetic-reading deficit. Ideally, the classroom teacher should be involved in the planning.

The second part of the workshop was led by the remedial supervisor and consisted of matching perceptual training to the reading and arithmetic skills already written into each child's remedial program. Each child in the program had a contract which showed the objectives in his instructional program and the materials which were used for remediating the objectives. If the materials were appropriate for remediating a perceptual deficit, the teacher had only to write in the number of the perception objective beside the material that was used to remediate a math or reading skill. Both the teacher and the child were then alerted to the use of the material as a treatment for the perceptual deficit. For example, visual attending (perception objective V-6) could be improved with word recognition flashcards. Objective number V-6 would be written next to the flashcard drill listed on the child's contract. This very simple way of including perception in the child's contract facilitated the integration of perceptual training into the regular remedial program.

Teachers were required to write perception IIPs and to review them with the principal or the child's classroom teacher. Guidelines for writing a perception IIP were discussed and firmed up at this session.

1. Write each annual goal in behavioral terms. The thirteen perception objectives identified for this project are annual goals.
2. List short-term objectives or educational tasks in logical sequence. Each should be closely related to the annual goal.

3. Describe how you will measure what the student can do. Include the conditions in which learning will be evaluated.
4. Write in the success criteria. How well is the child expected to perform this skill? With 80 percent proficiency? With 90 percent proficiency?
5. Progress is recorded as each task is accomplished. In the progress column write (1) completed (and the date), (2) in progress, (3) inappropriate, (4) or not introduced.

The evaluation forms from this workshop contained favorable comments for the presentation of teaching arithmetic-reading. The perception IIP was regarded as "another form" by two respondents. Two others indicated that the IIP gave their perceptual training credibility. They would be able to show the classroom teacher and the principal what they were accomplishing with the child. Needs for the future included concerns about motivating slow students and reluctant students.

Workshop 4 handouts included in appendix 5:

Agenda, Workshop 4

'Rithmetic Reading-In the Center Spot, Jack Cassidy and Verna Sharkey
Arithmetic Skills, C. Czerniejeswki

Format for Problem Solving

Individualized Instructional Program, Perception

Writing Perception into the IEP, Marianne Tierney

Evaluation, Workshop 4

Workshop 5. Attending Behavior and Behavior Management

This workshop was conducted by the learning disabilities supervisor, Mrs. Lucille Naughton at the AIU Conference Center. All ten teachers who were participating in the perception project and the other 18 remedial teachers attended. Changing inappropriate behavior of the students had been a major concern. The workshop was designed to develop teachers' knowledge of behavior modification techniques. Workshop objectives were:

1. To identify strategies for managing behavior in the classroom.
2. To identify ways to reinforce desirable student behavior.
3. To identify reinforcers that motivate.

Mrs. Naughton discussed behavior modification as an attempt to alter the learner's behavior by manipulating the response-reinforcement contingencies which are controlling his behavior. The outline of her presentation, Behavior Modification Techniques, is in appendix 5.

Teachers saw the film "Who Did What to Whom" (Research Press Co. 17 min., color). Stop-action involved the teachers in the recognition of four basic principles of behavior in action; positive reinforcement, negative reinforcement, punishment, and extinction. The film was followed by discussion of the kinds of reinforcers that are appropriate in the mobile classroom and in remedial classes that meet for thirty-five or forty-five minutes two periods per week. Following the film, the learning disabilities supervisor discussed points to remember about reinforcement and short-term behavior modification techniques. Both are summarized on handouts included in appendix 5.

Using the Classroom Management Strategy Outline as a guide, the LD supervisor discussed the steps in designing a behavior management program for a hypothetical child and offered to consult on an individual basis with any teacher who needed to set up a management program for a student.

Workshop evaluation forms showed that teachers were made aware of the need to look at their own behavior before setting up BM strategies for the children. Response to the film was positive. Every teacher mentioned the need to use verbal and social reinforcers more.

Suggestions for future workshops included three requests for ways to motivate the seventh and eighth graders and ways to get them to attend to tasks for a sustained period of time. All other needs expressed were for individual students rather than for groups of children. Five teachers indicated they had no problems with behavior but were open to more ways to remediate math, reading, or perception deficits.

Workshop 5 handouts included in appendix 5:

Agenda, Workshop 5

Behavior Modification Techniques

Points to Remember about Reinforcement

Short-term Behavior Modification Techniques

Classroom Management Strategy Outline

Classroom Management Strategy, Margaret Vaughn

Evaluation, Workshop 5

Workshop 6. The Older Student, Perception and Motivation

The final workshop was directed to teachers of students in grades seven and eight. The content was appropriate for secondary students as well. All ten participating teachers and the other 18 staff members were present. Workshop objectives were:

1. To review materials which were appropriate for older students.
2. To identify and discuss strategies for motivating older students.
3. To provide some insight into the coping strategies of children.

The first part of the workshop consisted of a review of commercial materials which were available to the teachers. A program for the controlled reader and a tape-recorded math program were demonstrated by two teachers who had been using the materials intensively.

The second part of the workshop consisted of lecture-discussion session on ways to motivate older students. The learning disabilities supervisor first discussed the characteristics and coping techniques of learning disabled children. Many of the characteristics were perceptual deficits which were being treated in the remedial program. Techniques which would enable the children to cope with their deficits were enumerated and discussed. The discussion outline is included in appendix 5.

In response to the teachers' concerns about motivating the older student, the learning disabilities supervisor discussed classroom survival techniques for the individual with learning difficulties. The content of her presentation is summarized in a handout included in appendix 5. The following points were emphasized:

1. Instruction must be relevant.
2. Students must experience success.
3. Materials and techniques must match the child's maturity level as well as his ability level.
4. Accomplishments must be recognized.
5. Students should be involved in planning their instructional programs and in goal setting.
6. Contracting provides guidelines for work and reward for accomplishment at a criterion level.
7. Students must have a way of "seeing" their own progress in the form of better grades, improved learning rate, raised grade equivalent scores, recognition by classroom teachers.
8. The use of graphs helps them visualize progress.

Evaluation comments indicated that there were still some concerns about motivating the reluctant older learner. The following comments reflect views which were expressed by two or more teachers. Evidence of progress not always gratifying to the older student particularly if he shows a significant gain on the posttest but is still achieving below his grade level. Computing the child's learning rate offers him another way of looking at achievement. The older student who has experienced many years of failure is reluctant to "try again". It is easier for him (or her) to refuse to try rather than risk another failure.

Needs for the future included continued consultation service from the learning disabilities supervisor and counseling for students who do not respond well to remediation. Those suggestions came from three teachers. Six teachers, on the other hand, said they were having no difficulties with motivation at any age level.

Workshop 6 handouts included in appendix 5:

Agenda, Workshop 6

Learning Disabilities: Characteristics and Coping Techniques

Survival--Regular Classroom Techniques for the Individual with
Learning Difficulties

Evaluation, Workshop 6

CHAPTER X

EVALUATION

Formative Evaluation

Formative evaluation during the development and implementation of the perception component was carried out in several ways. The content of each workshop was evaluated at the end of each session. Teachers' comments and concerns were taken into consideration in the planning of each subsequent workshop.

The extent of implementation in the field was observed during clinical supervision. Using the student observation form to record the amount of time spent on perceptual activities, the supervisor watched the use of perceptual instruction go from baseline 0 for most teachers to a range of from 27 percent to 46 percent of the students' collective time. The data from two observations for each of the 10 teachers is shown in table 7. Notice that the mean percent of time spent on perception went from 2 percent to 37.7 percent. At the beginning of the project, only one teacher was providing perceptual training. By February of 1978, all of the teachers in the project appeared to be giving some kind of perceptual training for at least one fifth of the students' collective time. During the first round of observations, a total of 53 children at ten different locations were observed. The last round of observations included 49 children at ten sites.

TABLE 7

Percent of Pupils' Time Spent
on Perceptual Training

Teacher	First Observation	Final Observation
1	0	42
2	0	36.5
3	22	38
4	0	42
5	0	38
6	0	46
7	0	35.5
8	0 M=2.2	29 M=37.7
9	0	43
10	0	27

During the observations, two of the three math teachers mentioned that several students (four in all) who had been having difficulty with keeping columns of numerals straight had improved even though no special training in writing columns had been given. An examination of the students' folders showed that those children (students M66, 97, 99, 100) had been given training in writing numerals legibly (objective V-7) and in visual discrimination (objective V-1). Whether the straight columns can be attributed to perceptual training, or to teacher's expectation, is a matter for conjecture.

Evaluating the mastery of perceptual skills was a new experience, and how to show progress was a problem. Mastery of a skill at one level required additional practice when reintroduced at a higher level. For example, when children had mastered objective V-5, visual memory, and could write correctly a three digit numeral after a brief exposure, additional practice was needed to master the task when four digits were used, and again when five digit stimuli were used. Mastery was achieved when the child could correctly reproduce eight out of ten figures at his working level. The child did not move to a higher level until he had demonstrated at least 80 percent mastery at the lower level. Each higher level was considered to be a new short term goal. Either ten or twenty items were used on each perception practice. It was then easy to determine when the child had reached the 80 percent mastery level. Teachers recorded mastery at each level of difficulty for each perception objective on the IIP.

Formative evaluation revealed that some perceptual deficits were not easily corrected. For example, for a few students, the difference between the f sound and the th sound was not discriminated if the speaker's lips were not visible (objective A-1). Reading specialists had to teach the sound/symbol correspondence of /f/ and /th/ visually. They had to make sure that each child could see the teacher when those sounds were used. Also, classroom teachers were notified so that spelling dictation and phonics practice might include visual clues to the sounds. The objective on the IIP had to be modified to include "seeing the speaker's lips" for a few children.

Evaluation of the mastery of reading and arithmetic objectives was accomplished with skill sheets, workbook exercises, paper and pencil tests,

recitation and kit materials. Mastery of objectives was noted on each child's IIP and on the management forms which were used.

In short, formative evaluation was used to monitor students' progress. It guided the content of the workshops. During formative evaluation, teachers solved the problems of how to evaluate progress in perception skills.

Summative Evaluation

The project was evaluated in open discussion by the participating teachers at the June 1979 evaluation workshop in terms of the performance and process objectives and in terms of the following:

1. The progress of the children in perception, reading, and arithmetic
2. Tests used to evaluate growth in all three areas
3. The use of reading and arithmetic materials to treat perceptual deficits
4. The teachers' training program
5. Unanticipated outcomes of the project
6. The supervisor's role in the project
7. The teachers' needs in terms of the coming year
8. The need for perceptual screening in 1979-1980
9. The extent of perceptual screening in 1979-1980.

In addition to open discussion, the teachers responded to the Survey of Needs (originally administered in August) and provided written responses to the following questions:

1. What should be eliminated from the perception program?
2. What aspects of the program should be retained?
3. What could have been done better?

Parallel suggestions from three or more teachers were taken as critical concerns in formulating plans for the next year.

Evaluation of Terminal Performance Objectives

The data for the evaluation of terminal performance objectives are in table 8. The Key on pages 104-105 explains the content of each column.

Terminal Performance Objective 1. Given two periods of instruction per week, each student will show improvement in reading or arithmetic by attaining or exceeding the modified expected achievement level in column 17, table 6.

Evaluation data for the terminal performance objectives are in table 8. Whether or not the child attained his MEA level can be seen by comparing the posttest score in column 4, table 8, with the MEA level in column 2. The plus signs (+) in column 3 indicate that eighty-two of the one hundred children met their predicted MEA levels. Minus signs (-) in column 3 show that eighteen students did not meet their MEA levels. Of the eighteen, three students showed no gain on the posttest. Another five had lower achievement scores on the posttest than they had had on the pretest. Two students missed their predictions by one month (.1). Another eight fell short of their predictions by three to eight months. With the many variables that affect a student's performance at test time, a success rate of 82 percent among perceptually impaired remedial students was reasonable.

Pretest and posttest scores were compared for gains. Column 6, table 8, shows the GE gain score for each child. The mean gain was 1.4 for the reading program and 1.05 for the arithmetic program. An investigation of Title I ESEA reports for 1969-1974 showed that across grades, mean GE gains were consistently near 1.1 months for each month of

instruction.⁴³ The mean gains demonstrated in this project were consistent with the gains in the federal program.

Terminal Performance Objective 2. Given two periods of instruction per week, each student was expected to accomplish the objectives in column 15, table 6, at the criterion level specified in column 16, table 6.

The criterion level of mastery has been repeated in column 7, table 8. The plus signs (+) in column 8 show that 89 children reached the mastery levels predicted by their teachers. The other 11 students had one or more objectives which were still "in progress" at the time of the evaluation.

Terminal Performance Objective 3. Given perceptual training, each student was expected to demonstrate improvement in the perception objectives in column 12, table 6, according to the mastery predictions in columns 13 and 14, table 6.

The data for the evaluation of perceptual training are seen in columns 9-13 in table 8. Every child in the study showed improved performance on perceptual tasks when posttest scores were compared with pretest scores. Error scores on the pretest (column 12) ranged from 20 to 67. The posttest scores (column 11) ranged from 9 to 49 and gave evidence of the reduction in the number of perception errors. Eighty-four of the 100 children met their predicted scores when given the Slingerland as a posttest. There was no basis for the prediction other than teacher judgment. Failure to meet the prediction by 16 students was due to unrealistic goals set by the teachers rather than to the type of instruction.

⁴³ Thomas C. Thomas and Sol H. Pelavain, Patterns in ESEA Title I Reading Achievement (Menlow Park, CA: Stanford Research at Menlow, ED 120 687, 1976), pp. 39-42.

KEY TO POSTTEST DATA IN TABLE 8

Table 8 contains the data needed to evaluate the outcomes of the perception project. To facilitate evaluation, some of the data presented in table 6, has been included in this table so that the reader will not have to flip pages. The student numbers in table 8 correspond to the student numbers in table 6. Headings in table 8 show which columns the data were taken from. The MEA levels in table 8 were taken from column 17 in table 6. Pretest scores came from column 7. The content of each column is explained below.

Column

- * Grade Completed shows the grade level that the child completed in 1978-1979 during the perception project.
- 1. Student Number identifies each child in the project. R designates reading; M designates arithmetic (math). Student numbers correspond to those on the pupil data sheets on pages 31-39.
- 2. MEA Level was taken from column 17 of the pupil data sheets on pages 31-39. The MEA level is the modified achievement level which was predicted for each child. It shows the minimum achievement level which the child was expected to attain as an outcome of his individualized instructional program. The formula for finding the MEA level takes into account the child's pretest score, his IQ, and other factors which influence learning. The formula is described on pages 23-28.
- 3. Met+/Not- indicates whether or not the MEA level was met on the posttest. Posttest scores in column 4 were compared with MEA levels in column 3. A plus sign (+) shows that the MEA level was met. A minus sign (-) means that the MEA level was not met.
- 4. Posttest is the end-of-program achievement score obtained on the SRA achievement test. The score is expressed as a grade equivalent.
- 5. Pretest shows each child's entry level. It was taken from column 7 of the pupil data sheets on pages 31-38.
- 6. Gain is the difference between the pretest and the posttest score shown in years and tenths of a year. The posttest score should be higher than the pretest score. If the student obtained a lower score in the posttest, his loss is shown as a negative number.
- 7. Mastery taken from column 16 of table 6 on pages 31-39 refers to the level of mastery the child was expected to attain on a given percent of his instructional objectives. Student R-1, for example, was expected to complete 60 percent of his reading objectives with 80 percent mastery. Student M-62 was expected to complete 80 percent of his arithmetic objectives with 80 percent mastery.
- 8. Met+/Not- shows that the mastery predictions in column 7 were met (+) or not met (-).

9. Predict perception score was taken from column 14 on table 6. The scores are lower than the pretest scores in column 12 in table 8. Teachers predicted a reduced perception score for each child. Predictions were based on the teacher's opinion of the child's ability to improve in perceptual skill.
10. Met+/Not- shows whether or not the predicted perception score was met. Because perception scores were error scores, each child should have obtained either the predicted score or a lower score on the posttest. Students R-1 through R-13 met their predictions. Students R-14 and R-15 did not.
11. Posttest is the perception score obtained on the second administration of the Slingerland. It should be lower than the pretest score. Every student showed a reduction in the number of errors on the posttest.
12. Pretest Perception Score taken from column 11 in table 6 is the total error score obtained on the first administration of the Slingerland Screening Tests. A score of 15 or more errors was considered to be significant warning of the possibility of perception deficits. Perception error scores ranged from 20 to 67.
13. Mastery contains plus signs (+) indicating that all children attained the mastery level expected of him. The predicted mastery level was shown in column 13, table 6, as 100% obj. at 80% mastery. Each child was expected to complete 100 percent of his perception objectives with 80 percent mastery at a level of difficulty that was appropriate for the child. Every child in the program met the prediction.
14. R/D refers to refer or dismiss. Each child's progress was evaluated. Using the data in table 8, teachers evaluated each child's progress. An R shows that the child was referred for further remediation. The letter D signified dismissal from the program. R/D signified that the child had made gains but needed a maintenance program of instruction for one period per week. Classroom performance was considered in the decision. For example, student R-6 posttested at the 3.1 level at the end of the second grade. His gain for one year was 2.1. Perceptual deficits are still high. Classroom performance (not shown here) does not match the performance level demonstrated on the posttest. The child will be re-referred for a reduced program of maintenance. Perceptual deficits will be given attention. Only five children were clearly recommended for dismissal. Fifteen students (RD) were recommended for maintenance programs of instruction for one period per week. The remainder were referred for remedial instruction.

TABLE 8

POSTTEST DATA

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grade Com- pleted	Student Number Col. 1	ACHIEVEMENT							PERCEPTION					R/D
		MEA Level Col. 17	Met+ Not-	Posttest	Pretest Col. 7	Gain	Mastery Col. 16	Met+ Not-	Predict Col. 14	Met+ Not-	Posttest	Pretest Col. 11	Mastery Col. 13	
2	R-1	1.8	+	1.9	1.0	.9	60% obj at 80% mastery	+	40	+	36	56	+	R
2	R-2	1.8	+	2.9	1.1	1.8	60% obj at 80% mastery	+	35	+	29	52	+	RD
2	R-3	1.6	-	1.5	1.0	.5	60% obj at 80% mastery	+	25	+	21	39	+	R
2	R-4	2.0	+	2.1	1.0	.9	90% obj at 80% mastery	+	18	+	15	37	+	R
2	R-5	2.2	+	2.2	1.1	1.1	60% obj at 80% mastery	+	25	+	23	43	+	R
2	R-6	1.7	+	3.1	1.0	2.1	60% obj at 80% mastery	+	25	+	20	37	+	RD
2	R-7	1.8	+	1.9	1.0	.9	60% obj at 80% mastery	+	25	+	17	34	+	R
2	R-8	1.7	+	2.2	1.0	1.2	50% obj at 80% mastery	+	30	+	24	43	+	R
2	R-9	2.0	+	2.7	1.0	1.7	60% obj at 80% mastery	+	25	+	11	34	+	R
2	R-10	2.2	+	2.2	1.5	.7	50% obj at 80% mastery	+	29	+	22	34	+	R
2	R-11	2.0	-	1.9	1.3	.6	70% obj at 80% mastery	+	12	+	12	24	+	R
2	R-12	1.9	+	3.1	1.0	2.1	50% obj at 80% mastery	+	27	+	12	33	+	RD

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grade Com- pleted	Student Number Col. 1	ACHIEVEMENT							PERCEPTION					R/D
		MEA Level Col. 17	Met+ Not-	Posttest	Pretest Col. 7	Gain	Mastery Col. 16	Met+ Not-	Predict Col. 14	Met+ Not-	Posttest	Pretest Col. 11	Mastery Col. 13	
2	R-13	2.0	+	4.4	1.0	3.4	70% obj at 80% mastery	+	35	+	24	47	+	D
2	R-14	2.0	+	3.3	1.1	2.2	50% obj at 80% mastery	+	25	-	28	39	+	D
3	R-15	1.9	+	2.9	1.0	1.9	60% obj at 80% mastery	+	20	-	21	37	+	R
3	R-16	2.1	+	3.6	1.1	2.5	60% obj at 80% mastery	+	25	+	12	36	+	RD
3	R-17	2.6	+	2.7	1.9	.8	60% obj at 80% mastery	+	15	-	17	28	+	R
3	R-18	2.7	+	3.2	1.9	1.3	60% obj at 80% mastery	+	30	-	32	41	+	R
3	R-19	3.1	+	5.1	2.1	3.0	95% obj at 90% mastery	+	35	+	26	51	+	D
3	R-20	3.3	+	3.7	2.3	1.4	50% obj at 80% mastery	+	20	+	12	39	+	RD
3	R-21	2.7	+	3.2	1.9	1.3	60% obj at 80% mastery	+	30	+	16	42	+	R
3	R-22	2.4	+	2.7	1.6	.9	80% obj at 80% mastery	+	25	+	22	49	+	R
3	R-23	2.1	+	3.3	1.1	2.2	80%obj at 80% mastery	+	30	-	35	43	+	R
3	R-24	2.6	-	2.3	1.9	.4	50% obj at 80% mastery	+	40	+	34	56	+	R

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grade Completed	Student Number Col. 1	ACHIEVEMENT							PERCEPTION					R/D
		NEA Level Col. 17	Met+ Not-	Posttest	Pretest Col. 7	Gain	Mastery Col. 16	Met+ Not-	Predict Col. 14	Met+ Not-	Posttest	Pretest Col. 11	Mastery Col. 13	
4	R-25	2.9	+	3.5	2.3	1.2	60% obj at 80% mastery	+	30	+	23	45	+	R
4	R-26	2.9	+	3.1	2.2	.9	70% obj at 80% mastery	+	39	+	33	59	+	R
4	R-27	3.7	+	4.1	3.0	1.1	50% obj at 70% mastery	+	25	+	17	39	+	RD
4	R-28	4.0	+	4.9	2.9	2.0	50% obj at 85% mastery	+	30	+	16	49	+	RD
4	R-29	2.8	-	2.2	2.1	.1	60% obj at 80% mastery	-	32	+	22	53	+	R
4	R-30	3.0	-	2.2	2.2	.0	70% obj at 80% mastery	+	25	+	21	42	+	R
4	R-31	1.8	+	2.1	1.0	1.1	80% obj at 80% mastery	-	30	-	33	47	+	R
4	R-32	3.1	+	3.8	2.5	1.3	80% obj at 85% mastery	+	25	+	15	39	+	R
4	R-33	2.7	+	4.2	2.1	2.1	80% obj at 85% mastery	+	30	+	17	45	+	R
5	R-34	3.9	+	4.9	3.1	1.8	70% obj at 90% mastery	-	18	+	12	32	+	RD
5	R-35	3.0	+	4.2	2.1	2.1	70% obj at 90% mastery	+	10	+	9	20	+	R
5	R-36	3.7	+	3.9	2.9	1.0	70% obj at 90% mastery	-	13	+	13	25	+	R

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grade Com- pleted	Student Number Col. 1	ACHIEVEMENT						Met+	PERCEPTION					R/D
		MEA Level Col. 17	Met+ Not-	Posttest	Pretest Col. 7	Gain	Mastery Col. 16		Predict Col. 14	Met+ Not-	Posttest	Pretest Col. 11	Mastery Col. 13	
5	R-37	3.3	+	4.9	2.6	2.3	70% obj at 90% mastery	-	35	+	17	49	+	R
5	R-38	4.7	-	3.1	3.9	- .8	70% obj at 80% mastery	+	20	-	28	36	+	R
5	R-39	4.3	-	2.4	3.4	-1.0	50% obj at 80% mastery	+	20	+	15	39	+	R
5	R-40	2.7	+	3.1	2.1	1.0	60% obj at 80% mastery	+	45	+	32	67	+	R
5	R-41	2.9	+	4.8	2.1	2.7	80% obj at 80% mastery	+	40	+	34	59	+	R
5	R-42	4.6	+	4.7	3.7	1.0	80% obj at 80% mastery	+	40	+	31	52	+	R
5	R-43	3.0	+	4.2	2.3	1.9	80% obj at 75% mastery	+	15	-	20	29	+	R
5	R-44	2.5	+	2.9	1.7	1.2	70% obj at 75% mastery	+	30	+	25	55	+	R
5	R-45	4.2	+	4.5	3.4	1.1	60% obj at 70% mastery	+	40	+	34	52	+	R
5	R-46	3.5	+	3.7	2.6	1.1	75% obj at 80% mastery	+	25	+	18	36	+	R
5	R-47	4.3	+	5.7	3.4	2.3	80% obj at 80% mastery	+	25	+	21	39	+	RD
5	R-48	2.8	+	3.9	2.1	1.8	80% obj at 80% mastery	+	30	+	25	42	+	R

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grade Com- pleted	Student Number Col. 1	ACHIEVEMENT							PERCEPTION					R/D
		MEA Level Col. 17	Met+ Not-	Posttest	Pretest Col. 7	Gain	Mastery Col. 16	Met+ Not-	Predict Col. 14	Met+ Not-	Posttest	Pretest Col. 11	Mastery Col. 13	
6	R-49	2.8	+	5.3	2.1	3.2	65% obj at 80% mastery	+	20	+	20	35	+	R
6	R-50	3.3	+	4.7	2.6	2.1	80% obj at 80% mastery	+	30	+	19	42	+	R
6	R-51	4.2	-	3.0	3.3	-3	100%obj at 80% mastery	+	20	-	30	37	+	R
6	R-52	5.0	+	6.2	4.2	2.0	80% obj at 80% mastery	+	15	+	12	29	+	R
6	R-53	2.9	+	2.9	2.1	.8	70% obj at 75% mastery	+	30	+	23	54	+	R
7	R-54	4.3	-	2.2	3.7	-1.5	70% obj at 80% mastery	+	20	-	27	36	+	R
7	R-55	5.4	+	5.7	4.5	1.2	70% obj at 80% mastery	+	30	+	21	49	+	R
7	R-56	2.8	+	3.1	2.1	1.0	80% obj at 80% mastery	+	20	+	18	37	+	R
7	R-57	5.8	-	5.3	4.9	.4	60% obj at 80% mastery	+	20	+	16	35	+	R
8	R-58	3.6	+	5.3	2.9	2.4	60% obj at 75% mastery	+	15	+	12	29	+	R
8	R-59	4.6	+	6.5	3.7	2.8	60% obj at 75% mastery	+	15	+	9	32	+	R
8	R-60	7.2	+	8.1	6.3	1.8	100%obj at 80% mastery	-	15	+	11	29	+	RD

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grade Com- pleted	Student Number Col. 1	ACHIEVEMENT							PERCEPTION					R/D
		NEA Level Col. 17	Met+ Not-	Posttest Col. 7	Pretest Col. 7	Gain	Mastery Col. 16	Met+ Not-	Predict Col. 14	Met+ Not-	Posttest Col. 11	Pretest Col. 11	Mastery Col. 13	
8	R-61	3.4	+	6.3	2.1	4.2	80% obj at 80% mastery	+	30	+	21	45	+	RD
2	M-62	1.8	+	2.1	1.0	1.1	80% obj at 80% mastery	-	20	+	15	34	+	R
2	M-63	2.4	+	3.7	1.5	2.2	100%obj at 85% mastery	+	25	+	20	40	+	D
3	M-64	3.3	+	3.4	2.5	.9	60% obj at 85% mastery	-	40	-	43	52	+	R
3	M-65	1.8	+	4.6	1.0	3.6	70% obj at 85% mastery	+	30	+	27	45	+	D
3	M-66	1.8	+	2.3	1.2	1.1	70% obj at 85% mastery	+	30	-	38	49	+	R
3	M-67	2.9	+	3.2	2.1	1.1	75% obj at 75% mastery	+	25	+	24	37	+	R
3	M-68	2.4	+	2.8	1.7	1.1	60% obj at 80% mastery	+	40	-	49	56	+	R
3	M-69	1.5	+	2.4	1.0	2.4	70% obj at 80% mastery	-	35	+	28	58	+	R
3	M-70	2.9	+	3.4	1.9	1.5	60% obj at 80% mastery	+	30	+	23	49	+	R
3	M-71	2.6	+	2.6	1.9	.7	100%obj at 80% mastery	+	25	-	27	43	+	R
4	M-72	3.6	+	3.8	2.6	1.2	80% obj at 80% mastery	+	15	+	14	29	+	R

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grade Com- pleted	Student Number Col. 1	ACHIEVEMENT							PERCEPTION					R/D
		MEA Level	Met+	Posttest	Pretest	Gain	Mastery	Met+	Predict	Met+	Posttest	Pretest	Mastery	
		Col. 17	Not-		Col. 7		Col. 16	Not-	Col. 14	Not-		Col. 11	Col. 13	
4	M-73	4.7	-	3.9	3.7	.2	60% obj at 80% mastery	+	30	+	26	49	+	R
4	M-74	3.0	+	3.1	2.1	1.0	75% obj at 80% mastery	+	35	+	27	57	+	R
4	M-75	4.3	+	4.4	3.2	1.2	75% obj at 80% mastery	+	35	+	33	53	+	R
4	M-76	2.5	-	2.1	1.7	.4	60% obj at 75% mastery	+	35	+	29	52	+	R
4	M-77	3.5	-	2.8	2.8	.0	60% obj at 80% mastery	+	30	+	27	42	+	R
4	M-78	3.2	+	3.6	2.5	1.1	80% obj at 80% mastery	+	40	+	37	52	+	R
4	M-79	3.9	-	3.6	3.2	.4	60% obj at 80% mastery	+	39	+	32	49	+	R
4	M-80	2.8	+	3.1	2.1	1.0	90% obj at 80% mastery	+	40	+	37	54	+	R
4	M-81	3.7	+	4.4	2.8	1.6	90% obj at 80% mastery	+	25	+	12	39	+	R
5	M-82	4.9	+	5.4	3.9	1.5	70% obj at 80% mastery	+	30	+	23	47	+	RD
5	M-83	3.7	+	4.6	2.8	1.8	70% obj at 90% mastery	+	25	+	11	39	+	R
5	M-84	3.9	+	4.2	3.1	1.1	80% obj at 80% mastery	+	30	+	29	42	+	R

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Grade Com- pleted	Student Number Col. 1	ACHIEVEMENT							PERCEPTION					R/D
		MEA Level Col. 17	Met+ Not-	Posttest	Pretest Col. 7	Gain	Mastery Col. 16	Met+ Not-	Predict Col. 14	Met+ Not-	Posttest	Pretest Col. 11	Mastery Col. 13	
5	M-85	3.8	-	3.5	3.2	.3	60% obj at 80% mastery	+	20	-	26	32	+	R
5	M-86	4.7	+	4.8	3.9	.9	75% obj at 75% mastery	+	25	-	31	39	+	R
5	M-87	4.7	-	4.1	3.8	.3	75% obj at 75% mastery	+	20	+	17	32	+	R
5	M-88	5.0	+	5.1	3.9	1.2	75% obj at 80% mastery	+	25	+	19	40	+	RD
5	M-89	5.1	+	5.1	4.1	1.0	80% obj at 80% mastery	-	15	+	14	29	+	RD
6	M-90	4.8	+	4.9	3.8	1.1	75% obj at 80% mastery	+	30	+	26	41	+	R
6	M-91	4.5	+	5.1	3.7	1.4	75% obj at 80% mastery	+	25	+	19	36	+	RD
6	M-92	6.5	+	7.9	5.4	2.5	60% obj at 80% mastery	+	30	+	21	42	+	D
5	M-93	5.4	-	3.0	4.5	-1.5	60% obj at 80% mastery	-	25	+	23	37	+	R
6	M-94	5.1	-	4.4	4.4	.0	60% obj at 80% mastery	+	35	+	27	42	+	R
7	M-95	3.3	+	3.8	2.7	1.1	100%obj at 80% mastery	+	25	+	24	39	+	R
7	M-96	4.0	+	4.8	3.1	1.7	70% obj at 85% mastery	+	35	+	26	42	+	R

[illegible]

Predictions of mastery on given perception objectives were met by all students as indicated by the plus sign (+) in column 13, table 8. The prediction indicated that all of the child's perception objectives would be accomplished with 80 percent mastery at a difficulty level which was consistent with his maturity and other factors which affect learning. Teachers' records indicated that each child was able to perform each perception task with error-free behavior at least 8 out of ten tries at a level of difficulty which was appropriate for the individual.

Objective 3 was met when all of the students showed a reduction in the error scores on the posttest. Predictions of 80 percent mastery on individual perception objectives were met by all students.

Evaluation of Process Objectives

Process Objective 1. Given time out of the regular classroom, each student will receive individualized reading or arithmetic instruction which takes into account his perceptual modality, entry level, intelligence, and other factors which affect learning.

The student data forms which are included as table 6 contained the data pertaining to modality, entry level, intelligence, and other factors for each child. The students' contracts (figure 5, page 61) provided evidence of the students' receipt of individualized instruction. Each student was taught with materials which were appropriate for his or her individual strengths and needs.

Process Objective 2. Given a diagnostic assessment, each student will receive reading or arithmetic instruction in terms of specific instructional objectives that were identified in the diagnosis.

The instructional objectives recorded in column 15, table 6, match those on the pupil's contract (figure 5, page 61) and on the child's

IIP (figure 6, page 62). The signature on the IIP indicates that the child's program of instruction was reviewed by either his classroom teacher or by the principal to make sure that it was appropriate for the child. The existence of the signed IIPs is evidence of the student's having had individualized instruction in terms of specific instructional objectives.

Process Objective 3. Given a diagnostic assessment, each student will receive perceptual training for the perceptual deficits that were identified in the diagnosis.

The student observation form was used to record the amount of time spent on the remediation of perceptual deficits. Evidence that students received perceptual training is provided in table 7 on page 99. Teachers used one-fifth of the students' instructional time in perceptual training. The students' perception IIPs provide further documentation of their having received training in areas of perceptual deficit.

Process Objective 4. Given training in the identification, evaluation, and remediation of perceptual deficits, teachers will provide perceptual training for children whose perceptual deficits have been identified.

Having identified the students' perceptual needs as perception objectives (column 12, table 6) and having received training in remediating perceptual deficits, each teacher was expected to exhibit teaching behaviors that demonstrated that he or she was providing perceptual training for each student. The objective was met when the supervisor observed and recorded on the student record form the teacher's use of perceptual training in the mobile classroom. Documented observations showed that all ten teachers were providing perceptual training with appropriate materials for one-fifth of the pupils' time in remedial instruction. Table 7 on page 99 shows that all ten teachers were observed spending at least 20 percent of the students' time on the remediation of perception deficits.

Process Objective 5. Given the content of the in-service workshops and other resources needed to support a program of perception, the supervisor with the staff will produce a document that contains a record of the products and processes of the project and a handbook for the teachers.

Using the Checklist of Criteria for Evaluating the Handbook in figure 12, page 118, the staff gave the handbook a rating of very good or excellent on all of the items pertaining to the handbook. Their ratings are included in figure 12.

When evaluated by the Assistant Executive Director, the report earned a rating of very good in that it is comprehensive enough to permit replication of the project.

Teachers' Evaluation of Project

At the June evaluation meeting, the teachers discussed their perceptions of the following components of the project:

1. The progress of the children in perception, reading, and arithmetic was reflected not only in test scores but in classroom performance as well. Classroom teachers reported improved classroom performance in reading and arithmetic. Children who received perceptual training improved in their ability to maintain straight margins on their written work and to keep numbers in straight columns. There was noticeable reduction in errors due to reversals in class work. Classroom teachers noticed that auditory attending behavior had improved for several children.

Children who showed negative gains on the posttest had made progress during the program which was evident from the notation on their contracts and on their IIPs. Progress was evident in their class work. Not every child met his MEA level on the post-test. Because of the many variables that can affect performance on a single test, the success rate of 82 percent is sufficient to warrant the continued use of the MEA formula as a minimum achievement level.

2. The tests used to assess growth in reading, arithmetic and perception were evaluated by the teachers. The Primary I and Primary II Tests used for arithmetic and reading were acceptable. They were easily administered, scored, and had alternate forms. Test results were reliable.

CHECKLIST OF CRITERIA FOR EVALUATING HANDBOOK

KEY

- 1 Poor
2 Fair
3 Good
4 Very Good
5 Excellent

Rate each item on a scale of 1 to 5.

- | | |
|--|-------------|
| 1. The report of the process is comprehensive enough to permit replication of the project. | 1 2 3 4 (5) |
| 2. The process and product of each workshop session are sufficiently reported to allow replication of each workshop. | 1 2 3 4 (5) |
| 3. The handbook lists the fourteen perceptual areas treated and provides a definition of each. | 1 2 3 4 (5) |
| 4. The handbook contains a checklist of traits for identifying children for perceptual testing. | 1 2 3 (4) 5 |
| 5. The handbook provides strategies for identifying a child's learning modality. | 1 2 3 (4) 5 |
| 6. The handbook presents the rationale for using reading and arithmetic materials for the remediation of perceptual deficits. | 1 2 3 4 (5) |
| 7. The handbook contains specific perception activities for the remediation of each of the fourteen perceptual deficits. | 1 2 3 (4) 5 |
| 8. The handbook contains specific activities which use <u>reading</u> materials for the treatment of perceptual deficits. | 1 2 3 (4) 5 |
| 9. The handbook contains specific activities which use <u>arithmetic</u> materials for the treatment of perceptual deficits. | 1 2 3 (4) 5 |
| 10. More than 90 percent of the perception activities involve materials that are clearly either reading or arithmetic materials. | 1 2 3 4 (5) |
| 11. The handbook includes techniques and materials that can be used to remediate perceptual deficits in addition to those techniques presented in the workshops. | 1 2 3 (4) 5 |
| 12. The handbook lists instruments for assessing perceptual strengths and weaknesses in addition to those instruments used in the project | 1 2 3 (4) 5 |

To be acceptable, the handbook must have a rating of 4 or 5 on 90 percent of the items.

Figure 12. Teachers' rating of handbook.

The NRT Math and Reading, Form ES, Levels Blue, Green, and Red, which were used with grades 4 through 8 had no alternate forms which limited their use as a reading test. The children remembered the content from pretest to posttest. There was no such problem with the arithmetic subtest. Teachers recommended that the primary tests and the arithmetic subtest of the NRT Math and Reading Test be retained as part of the testing procedure. They further recommended that the Gates Mac Ginitie Reading Tests be used to evaluate reading growth.

The Slingerland Screening Tests, according to the teachers, yield an abundance of information about each child who was tested. They had several negative features. Administration and scoring were time consuming. Teachers thought there was much subjectivity in the scoring. The tests were diagnostic and not intended to be used as posttests. Teachers recommended that the Slingerland be used only as a diagnostic instrument to identify students perceptual modality and his perceptual deficits. Each perception objective should then have pretest and posttest exercises that would yield objective evidence of "before and after" skills. Teachers felt it was not necessary to treat any more perceptual objectives than those already identified. They had found that treatment of one objective often remediated other areas as well.

3. The use of reading and arithmetic materials to treat perceptual deficits was seen as productive. Children responded favorably to the suggestion that a given exercise would improve visual discrimination as well as provide practice in word recognition.
4. The teachers' training program was given a high rating. The input from the learning disabilities supervisor was oriented toward learning disabled children rather than toward children in the normal classroom setting. Workshop content was relevant. "Program has enabled me to do a workshop on perception at one of my schools," said a teacher.
5. The evaluation session revealed several unanticipated outcomes.
 - a. Perceptual remediation was less complicated than had been anticipated.
 - b. Within three or four sessions, children began to ask if the math or reading exercise would help the perceptual deficit. Children appeared to "tune in" to their perceptual needs. Some students showed an increasing awareness of their improvement in perceptual skills.
 - c. Teachers were surprised that perceptual training required so little time. Several had been apprehensive about the expenditure of time on perception at the expense of reading or arithmetic instruction.

- d. The improvement in attending behavior (both visual and auditory) and in figure-ground discrimination appeared to be an outcome of the child's awareness of his need to improve rather than an outcome of direct instruction.
 - e. Awareness of the use of regular instructional materials to improve perceptual skills carried over into the classroom. With a copy of the child's IIP as a guide, several classroom teachers reinforced the perceptual training in the classroom.
 - f. Handwriting improved with minimal instruction. Teachers provided models of good handwriting at eye-level. Cursive and manuscript alphabets were taped to desk tops and tables. Aside from correcting pencil grips and providing lined paper for all written work, little else was done to correct handwriting. Correct posture for writing and an occasional letter form was demonstrated. Teachers reported that gains in handwriting far exceeded the amount of actual instruction given.
6. The supervisor's role was evaluated as supportive. Several teachers saw the supervisor as a change agent. Others saw the supervisor as an educational leader who uses the talents of others. She was seen as an administrator who is responsive to the needs of the teachers. Supervisor recognized the public relations value of following through on the principals requests for perception in the reading program.
7. Teacher's needs for the coming year included:
- a. Fewer forms to complete
 - b. A battery of pretest and posttest exercises for perceptual skills
 - c. Simplified pupil data sheets
 - d. One or two workshops where teachers would have the chance to demonstrate teaching techniques that work for them
 - e. Ways to motivate reluctant learners
 - f. Continued consultation with the learning disabilities supervisor
 - g. How to handle problem children
8. The need for perceptual screening in 1979-1980, according to the teachers, would be no less than the present need. A simplified checklist or set of perceptual activities would aid in the identification of children who need to be screened with the Slingerland.

9. The teachers were divided in their views on the extent of perceptual screening. Five teachers maintained that all second and third graders in the remedial program be given the Slingerland as a preventative measure. Older students who appeared to have perceptual deficits should be tested. The other five held to the notion that only those children who appeared to have perceptual problems should be given the Slingerland evaluation. (The policy of parsimony in testing will prevail.)

When the Survey of Needs was administered in August 1978, only two teachers said they had the skills needed to help train other teachers. The second survey showed that nine teachers felt they had enough experience in the identification and treatment of children with perception problems to be able to serve as a trainer of teachers within the program (question 4). The data is shown in appendix 1.

Teachers' written responses are summarized. All ideas expressed by two or more teachers are included for questions 1 and 2. All of the responses from the teachers are enumerated for question 3.

1. What should be eliminated from the perception program? Eight teachers wanted all components retained. Three suggested that we seek an alternate to the Slingerland or another way of using it because of the time it takes to administer and score the test. Three wanted to see some of the paper work eliminated.
2. What aspects of the program should be retained? Seven teachers said unequivocally that all components should be retained. Five responded with a single word, "Everything."
3. What could have been done better? The individual responses to this question were diverse. No two expressed similar concerns.
 - a. All-day workshops. There was not enough time.
 - b. More behavior modification
 - c. More strategies for motivating older children in our situation
 - d. More time to share ideas with each other
 - e. What to do when the child says....

- f. More films on behavior management with remedial groups not in the regular classroom or in a mental hospital
- g. It was well-done
- h. All workshops were worthwhile
- i. No response from two teachers

CHAPTER XI

CONCLUSIONS AND RECOMMENDATIONS

Discussion of Outcomes

One might question the efficacy of using a formula to predict achievement outcomes in reading and arithmetic. The MEA level formula had been 95 percent effective in predicting a minimum posttest level for the students who were in the study group which was used in the evaluation of the diagnostic paradigm which was developed for and implemented in the remedial reading program.⁴⁴ It missed the mark by only one month for the remaining 5 percent with whom it was used to predict minimum achievement outcomes. That study group consisted of a crossection of students randomly selected from among all of the remedial students in grades 4 through 8 who were being served by the Allegheny Intermediate Unit. While they were all receiving remedial instruction, many were not seriously disabled. The students in the perception project, on the other hand, were those who exhibited the greatest deficits in reading or arithmetic and had perceptual deficits as well. The criteria for selecting students for this study group increased the likelihood that some children would not meet their MEA levels. The very selection process precluded a one-hundred percent success rate.

The project was considered successful even though only 82 percent

⁴⁴ Corinne Z. Piatt, "The Development and Implementation of a Diagnostic Paradigm for Remedial Reading in the Non-Public Schools Program" (Practicum report, Nova University, 1980) p. 84.

of the students had met their predicted MEA levels. With the many variables that affect a student's performance on a single test, a success rate of 82 percent among perceptually impaired low achieving students was reasonable. Fifteen of the eighteen children who did not attain their MEA levels obtained lower scores on the posttest than on the pretest or showed gains of four or fewer months. The students' contracts and their individual instructional programs, however, showed accomplishments that were not reflected in the posttest scores.

Why did some students not achieve their predicted scores on the posttest? Many variables influence the behavior of the student while he is taking a test. The testing situation is highly susceptible to uncontrolled variables such as test-taking motivation and test anxiety. There is some evidence that test-taking motivation varies widely in different ethnic and socioeconomic groups.⁴⁵ Some children work rapidly through a test making responses that are more or less at random. Convinced in advance that they cannot do well, they shorten the period of discomfort that the situation produces by getting through the test as quickly as possible.⁴⁶ Closely related to test-taking motivation is test anxiety. Children develop test anxiety because they perform poorly on tests and have experienced failure and frustration in previous test situations. A high level of anxiety appears to be detrimental to their test performance.⁴⁷

Other variables which affect the outcome of testing are situational conditions such as time limitations, events which occurred prior to

⁴⁵ Anne Anastasi, Psychological Testing, Third Edition (The MacMillan Company 1968), p. 570.

⁴⁶ Ibid.

⁴⁷ Ibid., p. 571-572.

testing, and the relationship between the student and the test administrator. The child who has had repeated failures is more likely to be affected by such conditions than is the success oriented student. The child's achievement in the classroom, on the playground, and in other situations help to shape his self-concept. His self-concept influences his performance. The two interact in a continuing spiral. The child's concept of self at the time of testing operates as a sort of private self-fulfilling prophecy.⁴⁸ With all of the variables that affect a single administration of an achievement test, it is not surprising that eighteen low-achieving students performed less well than was expected.

The teachers in the project hypothesized that if the posttest were re-administered, the eighteen percent would meet their MEA levels on the second trial. Because of the variables that affect the test performance of low achieving students, a different eighteen percent would fail to meet their MEA levels. The hypothesis bears testing.

A reduction in error scores for every child in the study group indicated that at least some of the perceptual deficits were remediable. Using arithmetic and reading materials appeared to satisfy the need to attend to perceptual deficits without denying the students of their reading and arithmetic instruction time. The time devoted to perceptual training appeared to contribute to a reduction in error scores on the Slingerland posttest. Perceptual deficits seemed to yield to treatment when the child had an increased awareness of the behavior which was being remediated.

⁴⁸ Anastasi, p. 578.

There appeared to be some "carry-over" from one perceptual skill to another. Children who received remediation in only one or two perceptual skills showed improvement in other perceptual areas on the posttest. For example, remediating visual orientation to details appeared to improve not only that skill but also visual discrimination and visual memory. Training in auditory memory appeared to improve auditory attention and vice versa.

How much of the improvement can be attributed to perceptual training and how much was the result of other factors is a matter for conjecture. All that can be said for certain is that the children made fewer errors on the perception posttest than they had made on the pretest. The reduction in error score could have been the result of any one of or a combination of (1) perceptual training, (2) maturation, (3) test practice, (4) teacher expectation, or (5) self-fulfilling prophecy. Lacking a control group in the project, no conclusions can be drawn about the impact of perceptual training on reading and arithmetic achievement.

Conclusions

Evaluation of the project outcomes has shown that the treatment of perceptual deficits can be integrated into the remedial program without consuming a disproportionate amount of instructional time. Perceptual training can be given with the same materials that are used for reading and arithmetic instruction. All of the children demonstrated improved performance on perceptual skills that were related to reading or arithmetic performance and were sampled by the Slingerland Screening Tests. All of the children showed evidence of growth in reading or arithmetic on their individual contracts and on their individual instructional programs (IIPs).

The project was considered to be successful even though only eighty-two of the one hundred children in the project matched or exceeded their predicted modified expected achievement levels in reading or arithmetic. With the many variables that can affect the performance of low-achieving students on a single test administration, a success rate of 82 percent is acceptable.

The use of predicted reduction scores in perception is not advocated. There is no basis for predicting the outcomes of perceptual training. Evaluation is better accomplished by periodic comparisons of the child's current performance with examples of his entry performance on a given task.

Teachers' skills in the identification, treatment, and evaluation of students' perceptual strengths and deficits grew with the project. New teachers will receive perceptual training as needed. Experienced teachers will continue to receive support and consultation service from experienced qualified staff.

The perception component will be implemented as a continuing part of the remedial service provided to the non-public schools.

Institutionalizing the Project

The content of each workshop and other resource material have been included in a handbook for the teachers' use. The handbook is in appendix 6. The report of all processes and the handbook will be combined as a model for the development of similar programs and will be on file in the Educational Resources Center as a resource for teachers and program developers. A brief report of the project will be presented to the Allegheny Intermediate Unit Board of Directors for approval as part of the remedial program with

the condition that the component remain open-ended and subject to annual review and revision by the supervisor and the staff in order to accommodate the perceptual needs of the children in the program.

Disseminating the Project

The extent of the project, the outcomes of the project, and plans for further implementation of the project were reported to the principals of the Greater Pittsburgh Catholic Diocese at five regional Deanery meetings held in the fall of 1979. A similar report was given to the private school principals at a meeting held in November at the intermediate unit. Finally, the project will be presented at the annual conference in October 1980 held by the Division of Non-Public Schools Services of the Pennsylvania Department of Education in Harrisburg. The conference provides a forum for the dissemination of new ideas and projects to the other twenty-eight intermediate units in the state.

Recommendations

The teachers and the supervisor have recommended that perceptual training be integrated into the remedial program on a permanent basis. Perceptual training can be accomplished with the same materials that are used for reading and arithmetic instruction. The following additional recommendations have emerged from the evaluation of the project:

1. Adopt a series of reading and arithmetic achievement tests that have three parallel forms at each level and are normed for out-of-grade testing. The alternate forms can be used to pretest, posttest, and retest as needed.
2. Review each child's MEA level prediction midway through the remedial program or whenever more is learned about the unique characteristics of the learner. If additional factors, positive or negative, have been identified, adjust the MEA prediction to reflect them.
3. Delete the predicted perception posttest score from the perception component of the remedial program. There is no basis for such a prediction.

4. Administer the Slingerland Screening Tests to only those children who appear to have perceptual deficits. The tests should not be used as a screening device for all of the children in the remedial program.
5. The Slingerland Screening Tests were administered as posttests to show that perceptual deficits, as reflected in the tasks on the tests, yield to remediation. The tests were used to quantify perceptual behavior. Students who improved showed a reduction in error scores on the posttest.

We do not recommend using the Slingerland Screening Tests in a pretest/posttest mode with the reduction of error scores as the goal. Evidence of improvement in the perceptual areas sampled by the tests may be demonstrated by periodically comparing the student's performance on perceptual tasks with the behaviors demonstrated on the initial administration of the Slingerland.

The Slingerland error scores should not be used for other than diagnostic purposes. They are not achievement scores. Some perceptual deficits have a physiological basis and may not yield to remediation. We reject the idea of adding another failure score to a child's achievement record.

6. Teach to each child's stronger modality. If the child is an auditory learner, build upon his auditory strengths. Remediate the visual deficits which are prerequisite to the reading or arithmetic skills which he is learning.
7. Match instructional materials to the child's stronger modality. Use multisensory materials judiciously with children who do not exhibit strength in either area. The lack of a modality preference may reflect the scorer's lack of scoring skill rather than the child's lack of perceptual skill.
8. Among children who have demonstrated strength in neither modality, watch for emerging strengths as remediation in the deficit areas progresses.
9. Identify no more than two or three perceptual objectives for remediation for a given child. Perceptual behaviors do not exist in isolation. Remediating one often improves a cluster of related skills. Remediate first the one that appears to be the most amenable to remediation.
10. Be reasonable in teacher expectations. Do not expect model handwriting, for example, from a palsied child. Some physiological deficits can be remediated only so far.

11. Repeat the perception training for new staff. Provide a review for experienced teachers. The content of the review should not repeat the content of the perception workshops which were used in this project.
12. Continue to provide consultation service to the staff. Certified and qualified staff should be available to the teachers to help plan instructional strategies and remedial techniques for the severely disabled and perceptually impaired students.

GLOSSARY OF TERMS

Achievement Index An indication of the child's expected achievement based on IQ. The formula is:

$$\text{Achievement Index} = \frac{\text{IQ}}{100}$$

AIU Allegheny Intermediate Unit - The middle level of the three tiered educational system in Pennsylvania. The levels are the State Department of Education, the intermediate units, and the local school districts.

Expected Achievement Level The posttest score which the child is expected to attain as a consequence of remedial instruction is called the expected achievement level. It is found by adding the pretest GE and the achievement index.

$$\text{EA Level} = \text{Posttest GE} + \frac{\text{IQ}}{100}$$

Flash-X A hand-held tachistoscopic device used for improving visual skills. Available from EDL/McGraw Hill.

GE Grade equivalent. Raw scores from tests are converted to grade equivalent scores.

Glass Analysis for Decoding Only A program for teaching decoding through perceptual conditioning written by Gerald G. Glass of Adelphi University.

IEP Individualized Educational Plan as mandated by public law 94-142.

IIP Individualized Instructional Program is the IEP adapted to the needs of the remedial program. It does not have the legal ramifications of the IEP.

ITPA The Illinois Test of Psycholinguistic Ability.

Math Expectancy is a grade equivalent score against which the child's achievement score is compared in order to ascertain the extent of the child's math disability. See page 8 in report. An expectancy is used to determine need.

MEA Level is the modified expected achievement level which the child is expected to attain as a consequence of remedial instruction. It takes into account the child's pretest score, IQ, and other factors that affect learning. The formula is:

$$\text{MEA level} = \text{Pretest GE} + \frac{\text{IQ}}{100} \pm \text{Other Factors}$$

Modality is the child's stronger sensory input channel, visual, auditory, or kinesthetic.

Pacer is a mechanical device for pacing a child through visual material at a given rate of speed. The Factpacer device from the SRA Arithmetic Fact Kit was used in this program.

Reading Expectancy is a grade equivalent score derived with the Bond-Tinker expectancy formula. The child's achievement level is compared to his expectancy to determine the degree of reading disability. The reading expectancy is used to determine the need for remediation.

SFTAA The California Short Form Test of Academic Aptitude.

WISC The Wechsler Intelligence Scale for Children.

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APPENDIX I

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SUMMARY REPORT ON CLASSES

NUMBER OF STUDENTS ADMITTED
TO REMEDIAL PROGRAM
PER GRADE

<u>Grade</u>	<u>Arithmetic Program</u>	<u>Reading Program</u>
1	3	
2	47	78
3	77	77
4	112	84
5	129	102
6	143	125
7	124	119
8	<u>138</u> 773	<u>103</u> 688
9	96	91
10	44	40
11	8	25
12	<u>8</u> <u>156</u>	<u>29</u> <u>185</u>
	929	873

Other Statistics

Total Buildings Served	53
Total Arithmetic Students	929
Total Reading Students	873
Total Arithmetic/Reading Students	1802

INDIVIDUALIZED INSTRUCTIONAL MATH/READING PROGRAM

ALLEGHENY INTERMEDIATE UNIT #3
NON-PUBLIC SCHOOLS PROGRAM

Instructional Area Reading Student's Name Jeff School Year 1978-1979

Annual Goal Given a word recognition or word-study exercise at his instructional level, Jeff will identify:

Short-Term Objectives

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
Prefix of a prefixed word	Phonics We Use D, 2 pages on two different days.	90% average on both pages	Completed 10-9-78
Comparative form to complete a sentence	Phonics We Use D, 2 pages; two days	90% average on both pages	Completed 10-23-78
Verb for subject-verb agreement	Teacher worksheets 78,79,80 on three different days.	90% average on three pages	Completed 11-13-78
Syllabication of a word	Spelling list for three consecutive weeks	90% average on three lists	In process
Synonym for a word	Trouble Shooter 1, Book 5, pp. 40-43 on three different days	90% average on three pages	Completed 12-11-78

Annual Goal Given a passage of connected prose reading at his independent level, Jeff will identify:

Short-Term Objectives

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
The main idea of the selection	Barnell Loft, Level D, Lessons 18-20	90% average of the three	In process
Sequence of main events	No flashbacks. Skill Builder 5-2 Dr. Brazil, p. 116; (He Changed, p. 78)	All correct or 90% average if both are used.	In process
Cause and Effect	Skill Builder 5-2, The North, p. 104.	80%	Not introduced
Author's purpose	New Skill Builder 5-1, Sixteen Sticks, p. 87; New World, p. 52; First Farmer, p. 31	Correctly identify author's purpose in two of the three stories	Not introduced

COMPUTATIONS FOR MEA LEVELS
PUPILS WITH PROBLEMS IN PERCEPTION

MEA = Pretest + $\frac{\text{WISC IQ}}{100}$ +/- .1 for each factor and perception

MEA = Pretest + $\frac{\text{SFTAA IQ}}{100}$ +/- .1 for each factor but not perception

R-1	1.0 + 1.07 -.3 = 1.77 = 1.8	R-26	2.2 + .82 -.1 = 2.92 = 2.9
R-2	1.1 + .95 -.3 = 1.75 = 1.8	R-27	3.0 + .88 -.2 = 3.68 = 3.7
R-3	1.0 + .91 -.3 = 1.6	R-28	2.9 + 1.07 -0 = 3.97 = 4.0
R-4	1.0 + .96 = 1.96 = 2.0	R-29	2.1 + .80 -.1 = 2.8
R-5	1.1 + 1.07 = 2.17 = 2.2	R-30	2.2 + .84 -0 = 3.04 = 3.0
R-6	1.0 + .85 -.2 = 1.65 = 1.7	R-31	1.0 + .89 -.1 = 1.79 = 1.8
R-7	1.0 + 1.0 -.2 = 1.8	R-32	2.5 + .89 -.3 = 3.09 = 3.1
R-8	1.0 + .85 -.2 + 1.65 = 1.7	R-33	2.1 + .89 -.3 = 2.69 = 2.7
R-9	1.0 + 1.10 -.1 = 2.0	R-34	3.1 + .86 -.1 = 3.86 = 3.9
R-10	1.5 + 1.01 -.3 = 2.21 = 2.2	R-35	2.1 + .89 -0 = 2.99 = 3.0
R-11	1.3 + .94 -.1 = 2.04 = 2.0	R-36	2.9 + .92 -.1 = 3.72 = 3.7
R-12	1.0 + .93 -0 = 1.93 = 1.9	R-37	2.6 + .83 -.1 = 3.33 = 3.3
R-13	1.0 + 1.04 -0 = 2.04 = 2.0	R-38	3.9 + 1.04 -.2 = 4.74 = 4.7
R-14	1.1 + 1.00 -0 = 2.0	R-39	3.4 + .97 -.1 = 4.27 = 4.3
R-15	1.0 + 1.16 -.3 = 1.86 = 1.9	R-40	2.1 + .71 -.1 = 2.71 = 2.7
R-16	1.1 + 1.06 -0 = 2.06 = 2.1	R-41	2.1 + .90 -.1 = 2.9
R-17	1.9 + .94 -.2 = 2.64 = 2.6	R-42	3.7 + .96 -.1 = 4.56 = 4.6
R-18	1.9 + .94 -.1 = 2.74 = 2.7	R-43	2.3 + .81 -.1 = 3.01 = 3.0
R-19	2.1 + 1.17 -.2 = 3.07 = 3.1	R-44	1.7 + .76 -0 = 2.46 = 2.5
R-20	2.3 + .96 -0 = 3.26 = 3.3	R-45	3.4 + 1.04 -.2 = 4.24 = 4.2
R-21	1.9 + .77 -0 = 2.67 = 2.7	R-46	2.6 + 1.0 -.1 = 3.5
R-22	1.6 + 1.0 -.2 = 2.41 = 2.4	R-47	3.4 + .96 -.1 = 4.26 = 4.3
R-23	1.1 + 1.11 -.1 = 2.11 = 2.1	R-48	2.1 + .92 -.2 = 2.82 = 2.8
R-24	1.9 + .79 -.1 = 2.59 = 2.6	R-49	2.1 + .90 -.2 = 2.8
R-25	2.3 + .84 -.2 = 2.94 = 2.9	R-50	2.6 + .90 -.2 = 3.3

R-51 $3.3 + .99 - .1 = 4.19 = 4.2$
 R-52 $4.2 + .87 - .1 = 4.97 = 5.0$
 R-53 $2.1 + .97 - .2 = 2.87 = 2.9$
 R-54 $3.7 + .74 - .1 = 4.34 = 4.3$
 R-55 $4.5 + 1.06 - .2 = 5.36 = 5.4$
 R-56 $2.1 + .74 - 0 = 2.84 = 2.8$
 R-57 $4.9 + .90 - 0 = 5.8$
 R-58 $2.9 + .80 - .1 = 3.6$
 R-59 $3.7 + .90 - 0 = 4.6$
 R-60 $6.3 + .94 - 0 = 7.24 = 7.2$
 R-61 $2.1 + 1.14 + .2 = 3.44 = 3.4$
 M-62 $1.0 + .81 - .1 = 1.81 = 1.8$
 M-63 $1.5 + 1.0 - .1 = 2.4$
 M-64 $2.5 + 1.04 - .2 = 3.34 = 3.3$
 M-65 $1.0 + .93 - .1 = 1.83 = 1.8$
 M-66 $1.2 + .79 - .2 = 1.79 = 1.8$
 M-67 $2.1 + .95 - .2 = 2.85 = 2.9$
 M-68 $1.7 + .85 - .2 = 2.35 = 2.4$
 M-69 $1.0 + .80 - .3 = 1.5$
 M-70 $1.9 + .96 - 0 = 2.86 = 2.9$
 M-71 $1.9 + .94 - .2 = 2.64 = 2.6$
 M-72 $2.6 + 1.01 - 0 = 3.61 = 3.6$
 M-73 $3.7 + 1.0 - 0 = 4.7$
 M-74 $2.1 + .91 - 0 = 3.01 = 3.0$
 M-75 $3.2 + 1.05 - 0 = 4.25 = 4.3$

M-76 $1.7 + .89 - .1 = 2.49 = 2.5$
 M-77 $2.3 + .89 - .2 = 3.49 = 3.5$
 M-78 $2.5 + .88 - .3 = 3.08 = 3.1$
 M-79 $3.2 + .81 - .1 = 3.91 = 3.9$
 M-80 $2.1 + .91 - .2 = 2.81 = 2.8$
 M-81 $2.8 + .95 - .1 = 3.65 = 3.7$
 M-82 $3.9 + .95 - 0 = 4.85 = 4.9$
 M-83 $2.8 + .85 - 0 = 3.65 = 3.7$
 M-84 $3.1 + .94 - .1 = 3.94 = 3.9$
 M-85 $3.2 + .76 - .2 = 3.76 = 3.8$
 M-86 $3.9 + .96 - .2 = 4.66 = 4.7$
 M-87 $3.8 + .92 - 0 = 4.72 = 4.7$
 M-88 $3.9 + 1.10 - 0 = 5.00 = 5.0$
 M-89 $4.1 + .96 - 0 = 5.06 = 5.1$
 M-90 $3.8 + 1.09 - .1 = 4.79 = 4.8$
 M-91 $3.4 + .87 - .1 = 4.47 = 4.5$
 M-92 $5.4 + 1.09 - 0 = 6.49 = 6.5$
 M-93 $4.5 + .99 - .1 = 5.39 = 5.4$
 M-94 $4.4 + .83 - .1 = 5.13 = 5.1$
 M-95 $2.7 + .74 - .1 = 3.34 = 3.3$
 M-96 $3.1 + 1.08 - .2 = 3.98 = 4.0$
 M-97 $3.8 + .92 - .1 = 4.62 = 4.6$
 M-98 $4.1 + .96 - .3 = 4.76 = 4.8$
 M-99 $3.7 + .78 - 0 = 4.48 = 4.5$
 M-100 $5.3 + .80 - .2 = 5.9$

PROJECT PARTICIPANTS

Teachers (and their schools) who will participate in the perception project are:

Reading

Noreen Begg	St. Joseph, Verona St. Mary, Glenshaw
Doug Brindle	St. Denis, McKeesport St. Angela, McKeesport
Lillian Casper	St. Sylvester, Brentwood St. Winifred, Castle Shannon
Deborah Furda	St. Alphonsus, Wexford St. Alexis, Wexford
Sally Reichard	St. James, Sewickley Sewickley Academy
Cynthia Rush	St. Bonaventure, Glenshaw Holy Trinity, Moon Run
Barbara Wieserman	St. Thomas More, Bethel Park St. Agatha, Bridgeville

Arithmetic

Brenda Anderson	St. Teresa, Munhall St. Paulinus, Clairton
Jane Carothers	St. Sebastian, Ross Township Providence Heights Alpha, Allison Park
Janice Davidson	St. Elizabeth, Pleasant Hills St. Joan of Arc, Library

EVALUATION OF PERCEPTION PROGRAM

Survey of Needs

Please respond by circling yes or no for items one through four. Write in the spaces provided for items five and six.

- | | | |
|--|-----------|----------|
| 1. Have you had training in the identification of perceptual problems in children? | YES
10 | NO |
| 2. Have you had training in the treatment of problems in: | | |
| visual perception? | YES
10 | NO |
| auditory perception? | YES
10 | NO |
| 3. Did you feel the need for training in the identification and treatment of perceptual problems in children? | YES | NO
10 |
| 4. Do you have enough experience in the identification and treatment of children with perception problems to be able to serve as a trainer of teachers in our own program? | YES
9 | NO |

Please write a thoughtful response to each of the questions. Your comments will be considered in planning next year's program.

1. What should be eliminated from the perception program?

Eight teachers wanted all components retained. Three suggested that we seek an alternate to the Slingerland or another way of using it because of the time it takes to administer and score the test. Three wanted to see some of the paper work eliminated.

2. What aspect of the program should be retained?

Seven teachers said unequivocally that all components should be retained. Five responded with a single word, "Everything."

3. What could have been done better?

Responses were diverse. No two were the same. All are recorded. All-day workshops. There was not enough time. More behavior modification. More strategies for motivating older children in our situation. More time to share ideas with each other. What to do when the child says.... More films on behavior management with remedial groups not in the regular classroom or in a mental hospital. It was well-done. All workshops were worthwhile. There were no responses from two teachers.

APPENDIX 2

Perception Objectives	143
Sample Perception IIP	145

PERCEPTION OBJECTIVES

Visual Perception

- V-1 Visual discrimination of structural details Given a visual stimulus word from a constant near point of reference, the student will identify the same word among a group of distractors.
- V-2 Visual orientation of details Given a brief exposure to a series of visual stimuli in the form of letters, numerals, words, and geometric forms from a near point, the student will write each form with the correct directionality.
- V-3 Visual discrimination of sequence Given a visual stimulus of a group of sentences from a far point of constant reference, the student will write the sentences in their correct order.
- V-4 Visual figure-ground discrimination Given a visual stimulus of a printed word or a five-digit numeral, the student will select the same word or numeral from among a group of distractors.
- V-5 Visual memory Given a brief exposure to a visual stimulus of two-, three-, four-, or five-letter words or numerals, the student will write the form with reasonable accuracy.
- V-6 Visual attention Given a visual stimulus which requires a specified period of attention which is reasonable in terms of the child's age, maturation, etc., the student will attend until the task is completed.
- V-7 Visual motor (Handwriting) Given a visual stimulus of a group of letters, words, numerals, or sentences, the student will write the stimulus forms with reasonable legibility and within a reasonable period of time.

Auditory Perception

- A-1 Auditory discrimination Given a pair of sounds auditorily, the student will tell whether they are the same or different.
- A-2 Auditory synthesis Given phonemic elements auditorily, the student will combine the phonemes to make a word or a nonword.
- A-3 Auditory analysis Given a spoken word, the student will identify initial, final, and medial phonemes.
- A-4 Auditory figure-ground Given an auditory stimulus against a background of sound, the student will make the appropriate verbal or written response.

- A-5 Auditory sequencing Given a sequence of auditory stimuli, the student will make the appropriate verbal or written response.
- A-6 Auditory memory Given an auditory stimulus, the student will demonstrate auditory memory by repeating the stimulus item or by writing an appropriate response.
- A-7 Auditory attention Given auditory stimuli requiring a reasonable period of attention, the student will attend until the task is completed.

Reasonable in the above objectives means appropriate for the individual when age, maturation, and other factors which affect learning are taken into consideration.

Instructional Area PerceptionStudent's Name CharlieSchool Year 1978-1979

V-5 Annual Goal Visual Memory - Given a brief exposure to a visual stimulus of 2, 3, 4, or 5 letter words or 2, 3, 4, or 5 digit numbers, the student will write the form with reasonable accuracy.

Short-Term Objectives

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
Flash two-digit number on flashcard	Practice, Shuffle, Test Set of 10 flashcards 1-second exposure	Practice, Shuffle, Test 10 of 10 right on test	Accomplished 10/2
Flash three-digit number on flashcard	1-second exposure	10 of 10 right on test	Accomplished 12/5
Flash four-digit number of flashcard	1 1/2-second exposure	10 of 10 right - may repeat test once	Accomplished 2/7
Flash five-digit number of flashcard	2-second exposure	10 of 10 right - may repeat test twice	In Process

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A-5 Annual Goal Auditory Sequencing - Given a sequence of auditory stimuli, the student will make the appropriate verbal or written response.

Short-Term Objectives

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
Dictate 2-digit numbers for subtraction	Put on tape - May replay	10 of 10 problems written correctly.	Accomplished 11/9
Teacher dictates 2 digit numbers for subtraction	Teacher repeats once	9 of 10 problems written correctly.	Accomplished 12/14
Teacher dictates 2 digit numbers for subtraction	Teacher repeats once	10 of 10 problems written correctly	Accomplished 1/17
Dictate 3-digit numbers for subtraction	Put on tape - May replay	10 of 10 problems written correctly	Accomplished 3/15
Teacher dictates 3-digit numbers for subtraction	Teacher repeats once	9 of 10 problems written correctly	In Process
Teacher dictates 3-digit numbers for subtraction	Teacher repeats once	10 of 10 problems written correctly.	

APPENDIX 3

Reading Objectives	147
Primary Reading Objectives	147
Intermediate Reading Objectives	151

PRIMARY READING OBJECTIVESPHONIC ANALYSIS

- PB6 Orally given a word that begins with the sound /w/ or /b/ or /s/, the learner will identify the letter (w, b, or s) that stands for the initial consonant sound.
- PB7 Orally given a word that begins with the sound /f/ or /d/ or /m/, the learner will identify the letter (f, d, or m) that stands for the initial consonant sound.
- PB8 Orally given a word that begins with the sound /j/ or /r/ or /h/, the learner will identify the letter (j, r, or h) that stands for the initial consonant sound.
- PB9 Orally given a word that begins with the sound /n/ or /v/ or /l/, the learner will identify the letter (n, v, or l) that stands for the initial consonant sound.
- PB10 Orally given a word that begins with the sound /y/ or /k/ or /g/, the learner will identify the letter (y, k, or g) that stands for the initial consonant sound.
- PB11 Orally given a word that begins with the sound /t/ or /p/ or /c/, the learner will identify the letter (t, p, or c) that stands for the initial consonant sound.
- PB20 Orally given a word that ends with the sound /p/ or /x/ or /f/, the learner will identify the letter (p, x, or f) that stands for the final consonant sound.
- PB21 Orally given a word that ends with the sound /n/ or /b/ or /t/, the learner will identify the letter (n, b, or t) that stands for the final consonant sound.
- PB22 Orally given a word that ends with the sound /k/ or /m/ or /d/, the learner will identify the letter (k, m, or d) that stands for the final consonant sound.
- PB25 Orally given a word that begins with a consonant blend sound, the learner will identify a pictured object whose name has the same initial consonant blend sound.
- PB26 Orally given a word that begins with the sound /st/ or /sk/ or /sl/, the learner will identify the letters (st, sk, or sl) that stand for the initial consonant blend sound.
- PB27 Orally given a word that begins with the sound /bl/ or /br/ or /pl/, the learner will identify the letters (bl, br, or pl) that stand for the initial consonant blend sound.

- PB28 Orally given a word that begins with the sound /cl/ or /cr/ or /gl/, the learner will identify the letters (cl, cr, or gl) that stand for the initial consonant blend sound.
- PB29 Orally given a word that begins with the sound /gr/ or /pr/ or /tr/, the learner will identify the letters (gr, pr, or tr) that stand for the initial consonant blend sound.
- PB33 Orally given a word that ends with the sound /st/ or /sk/ or /mp/, the learner will identify the letters (st, sk, or mp) that stand for the final consonant blend sound.
- PB34 Orally given a word that ends with the sound /nt/ or /nd/ or /nk/, the learner will identify the letters (nt, nd, or nk) that stand for the final consonant blend sound.
- PB37 Orally given a word that begins with a consonant digraph sound, the learner will identify a pictured object whose name has the same initial consonant digraph sound.
- PB38 Orally given a word that begins with the sound /wh/ or /ch/ or /sh/, the learner will identify the letters (wh, ch, or sh) that stand for the initial consonant digraph sound.
- PB42 Orally given a word that ends with the sound /sh/ or /ch/ or /th/, the learner will identify the letters (sh, ch, or th) that stand for the final consonant digraph sound.
- PB45 Orally given pairs of words, the learner will identify the words that have the same short vowel sound.
- PB46 Orally given a word that has a short vowel sound, the learner will identify a pictured object whose name has the same short vowel sound.
- PB48 Orally given a word that has a short vowel sound, the learner will identify the letter (a, e, or o) that stands for the short vowel sound.
- PB49 Orally given a word that has a short vowel sound, the learner will identify the letter (e, i, or u) that stands for the short vowel sound.
- PB51 Orally given pairs of words, the learner will identify the words that have the same long vowel sound.
- PB52 Orally given a word that has a long vowel sound, the learner will identify a pictured object whose name has the same long vowel sound.

- PB54 Orally given a word that has a long vowel sound, the learner will identify the letter(a, o, or i) that stands for the long vowel sound.
- PB55 Orally given a word that has a long vowel sound, the learner will identify the letter (e, i, or u) that stands for the long vowel sound.
- PB63 Orally given a word that has an r-controlled vowel sound, the learner will identify a pictured object whose name has the same r-controlled vowel sound.
- PB68 Orally given pairs of words, the learner will identify the words that rhyme.

STRUCTURAL ANALYSIS

- PC2 Given a set of words, the learner will identify those words that are compound.
- PC4 Given a contraction, the learner will identify the two words that form the contraction.
- PC10 Given a set of words, the learner will identify the one word that is singular.
- PC11 Given a set of words, the learner will identify the one word that is plural.
- PC24 Orally given a word, the learner will identify the number of syllables it contains.

VOCABULARY

- PD3 Given a word, the learner will identify its synonym.
- PD4 Given a word, the learner will identify its antonym.
- PD7 Given an unfamiliar word in context, the learner will identify the meaning of the word.
- PD8 Given a sentence with a word omitted, the learner will use context clues to identify the word to correctly complete the sentence.

COMPREHENSION

- PE3 Orally given a story, the learner will sequence illustrations of the main events in the story.
- PE4 Orally given a story, the learner will identify an illustration of an implied idea in the story.
- PE7 Given a reading selection, the learner will identify the main idea.
- PE8 Given a reading selection, the learner will identify an appropriate title.
- PE10 Given a reading selection, the learner will identify a detail from the material in the selection.
- PE11 Given a reading selection, the learner will identify the sequence of the major concepts.
- PE12 Given a sentence, the learner will identify a picture that shows the action or event described.
- PE14 Given sentences, the learner will identify statements as real or make-believe.
- PE18 Given a reading selection, the learner will identify the emotions of characters.
- PE19 Given a reading selection, the learner will identify a cause-and-effect relationship.

STUDY SKILLS

- PF1 Given a set of letters, the learner will identify the alphabetical order of the letters.
- PF4 Given a set of words, the learner will identify by initial letter the word that comes first in alphabetical order.
- PF5 Given a set of words, the learner will identify by second letter the word that comes first in alphabetical order.

INTERMEDIATE READING OBJECTIVES

PHONIC ANALYSIS

CONSONANT SOUNDS

Single ConsonantsInitial Consonants

- 1B1 Orally given a word that begins with a single consonant sound, the learner will identify a word that has the same initial consonant sound.
- 1B2 Orally given a word that begins with the sound /k/ or /s/, the learner will identify a word that has the same initial hard or soft consonant sound represented by the letter c.
- 1B3 Orally given a word that begins with the sound /g/ or /j/, the learner will identify a word that has the same initial hard or soft consonant sound represented by the letter g.

Medial Consonants

- 1B4 Orally given a word that has a medial consonant sound, the learner will identify a word that has the same medial consonant sound.

Final Consonants

- 1B5 Orally given a word that ends with a single consonant sound, the learner will identify a word that has the same final consonant sound.

Consonant CombinationsInitial Consonant Combinations

- 1B6 Orally given a word that begins with the sound /fr/ or /dr/ or /pr/, the learner will identify a word that has the same initial consonant combination sound represented by the letters fr, dr, or pr.
- 1B7 Orally given a word that begins with the sound /fl/ or /gl/ or /sl/, the learner will identify a word that has the same initial consonant combination sound represented by the letters, fl, gl, or sl.

- 1B8 Orally given a word that begins with the sound /sm/ or /sn/ or /sk/, the learner will identify a word that has the same initial consonant combination sound represented by the letters sm, sn, or sk.
- 1B9 Orally given a word that begins with the sound /sw/ or /sp/ or /sk/, the learner will identify a word that has the same initial consonant combination sound represented by the letters sw, sp, or sc.
- 1B10 Orally given a word that begins with the sound /str/ or /skr/ or /spr/, the learner will identify a word that has the same initial consonant combination sound represented by the letters str, scr, or spr.
- 1B11 Orally given a word that begins with the sound /sh/ or /th/ or /f/, the learner will identify a word that has the same initial consonant combination sound represented by the letters sh, th, or ph.
- 1B12 Orally given a word that begins with the sound /wh/ or /th/ or /ch/, the learner will identify a word that has the same initial consonant combination sound represented by the letters wh, th, or ph.
- 1B13 Orally given a word that begins with the sound /thr/ or /kw/ or /skw/, the learner will identify a word that has the same initial consonant combination sound represented by the letters thr, qu, or squ.

Final Consonant Combinations

- 1B14 Orally given a word that ends with the sound /st/ or /sk/ or /mp/, the learner will identify a word that has the same final consonant combination sound represented by the letters st, sk, or mp.
- 1B15 Orally given a word that ends with the sound /nt/ or /nd/ or /nk/, the learner will identify a word that has the same final consonant combination sound represented by the letters nt, nd, or nk.
- 1B16 Orally given a word that ends with the sound /sh/ or /ch/ or /th/, the learner will identify a word that has the same final consonant combination sound represented by the letters sh, ch, or th.
- 1B17 Orally given a word that ends with the sound /f/ or /g/ or /k/, the learner will identify a word that has the same final consonant combination sound represented by the letters gh, ng, or ck.

SILENT CONSONANTS

- 1B18 Given a set of words, the learner will identify the word that has a silent consonant.
- 1B19 Given a word that has a silent letter, the learner will identify the silent consonant.

VOWEL SOUNDSShort Vowels

- 1B20 Orally given a word that has the short vowel sound /ă/ or /ĕ/ or /ŏ/, the learner will identify a word that has the same short vowel sound.
- 1B21 Orally given a word that has the short vowel sound /ĕ/ or /ĭ/ or /ŭ/, the learner will identify a word that has the same short vowel sound.

Long Vowels

- 1B22 Orally given a word that has the long vowel sound /ā/ or /ō/ or /ī/, the learner will identify a word that has the same long vowel sound.
- 1B23 Orally given a word that has the long vowel sound /ē/ or /ī/ or /ū/, the learner will identify a word that has the same long vowel sound.

Vowel Combinations

- 1B24 Given a word that has two vowels in the medial position, the learner will identify which letter is sounded or which letter is silent.
- 1B25 Orally given a word that has the vowel sound /ā/ or /ē/ or /ū/, the learner will identify a word that has the same vowel sound represented by the letters ay, ee, or oo.
- 1B26 Orally given a word that has the vowel sound /ō/ or /ā/ or /ī/ the learner will identify a word that has the same vowel sound represented by the letters oa, ai, or ie.
- 1B27 Orally given a word that has the vowel sound /ē/ or /ū/ or /ō/, the learner will identify a word that has the same vowel sound represented by the letters ea, oo, or ow.

- 1B28 Orally given a word that has the vowel sound /ò/ or /ü/ or /ě/, the learner will identify a word that has the same vowel sound represented by the letters au, ew, or ea.
- 1B29 Orally given a word that has the vowel sound /ü/ or /ē/ or /ô/, the learner will identify a word that has the same vowel sound represented by the letters ue, ey, or aw.
- 1B30 Orally given a word that has the vowel sound /ôi/ or /aû/, the learner will identify a word that has the same vowel sound represented by the letters oi or ow.
- 1B31 Orally given a word that has the vowel sound /ôi/ or /aû/, the learner will identify a word that has the same vowel sound represented by the letters oy or ou.

R-Controlled Vowels

- 1B32 Orally given a word that has a r-controlled vowel (ar or or or er), the learner will identify a word that has the same r-controlled vowel sound.

STRUCTURAL ANALYSIS

COMPOUND WORDS AND CONTRACTIONS

- 1C1 Given the first part of a compound word, the learner will identify the second part.
- 1C2 Given a compound word, the learner will identify the meaning of the word.
- 1C3 Given a sentence with a compound word omitted, the learner will identify the compound word to correctly complete the sentence.
- 1C4 Given two words that can be contracted, the learner will identify their contraction.
- 1C5 Given a contraction, the learner will identify the two words that form the contraction.

AFFIXES

- 1C6 Given a suffixed word, the learner will identify the suffix.
- 1C7 Given a set of words, the learner will identify the suffixed word.
- 1C8 Given a sentence with a suffixed word, the learner will identify their contraction.
- 1C9 Given an obscure suffixed word and the meaning of its root, the learner will identify the meaning of the word.
- 1C10 Given a prefixed word, the learner will identify the prefix.
- 1C11 Given a set of words, the learner will identify the prefixed word.
- 1C12 Given a sentence with a prefixed word, the learner will identify the meaning of the word.
- 1C13 Given an obscure prefixed word and the meaning of its root, the learner will identify the meaning of the word.

PLURAL NOUNS

- 1C14 Given the singular form of a noun that forms its plural by the addition of s or es, the learner will identify the plural form.
- 1C15 Given the plural form of a noun that forms its plural by the addition of s or es, the learner will identify the singular form.

- 1C16 Given the singular form of a noun that forms its plural by the addition of les or ves, the learner will identify the plural form.
- 1C17 Given the plural form of a noun that forms its plural by the addition of les or ves, the learner will identify the singular form.
- 1C18 Given a noun that forms the plural in an irregular manner, the learner will identify the singular or plural noun.
- 1C19 Given a sentence with a noun omitted, the learner will identify a singular or plural noun to correctly complete the sentence.
- 1C20 Given sentences, the learner will identify the sentence in which the singular or plural nouns are used correctly.

POSSESSIVE NOUNS

- 1C21 Given a sentence with a possessive noun omitted, the learner will identify the possessive noun to correctly complete the sentence.
- 1C22 Given sentences, the learner will identify the sentence in which the possessive noun is used correctly.

PRONOUNS

- 1C23 Given a sentence with a pronoun, the learner will identify the noun that the pronoun refers to.
- 1C24 Given a sentence with a possessive pronoun omitted, the learner will identify the possessive pronoun to correctly complete the sentence.

COMPARATIVE AND SUPERLATIVE ADJECTIVES AND ADVERBS

- 1C25 Given a sentence with an adjective or adverb omitted, the learner will identify the comparative form of the adjective or adverb to correctly complete the sentence.
- 1C26 Given a sentence with an adjective or adverb omitted, the learner will identify the superlative form of the adjective or adverb to correctly complete the sentence.
- 1C27 Given sentences, the learner will identify the sentence in which the comparative form of an adjective or adverb is used correctly.
- 1C28 Given sentences, the learner will identify the sentence in which the superlative form of an adjective or adverb is used correctly.

VERB FORMS

- 1C29 Given a sentence with a verb omitted, the learner will identify the inflected verb form (s or es or ies) to correctly complete the sentence.
- 1C30 Given a sentence with a verb omitted, the learner will identify the inflected verb form (ing or ed or n) to correctly complete the sentence.
- 1C31 Given sentences, the learner will identify the sentence in which the inflected verb form is used correctly.
- 1C32 Given a sentence with the verb omitted, the learner will identify the verb necessary for subject-verb agreement.

WORD USAGE

- 1C33 Given a sentence with a word ending in er or or, the learner will identify the word as a noun, a verb, or an adjective.
- 1C34 Given a root word with a suffix, the learner will identify how the suffix changes the part of speech of the word.
- 1C35 Given a sentence with a word ending in s, the learner will identify the word as a verb, a plural noun, or a possessive noun.
- 1C36 Given a sentence in the present or past or future tense, the learner will identify the tense.

SYLLABLES AND ACCENTS

- 1C37 Orally given a two-, three-, or four-syllable word, the learner will identify the number of syllables it contains.
- 1C38 Given a two-, three-, or four-syllable word, the learner will identify the number of syllables it contains.
- 1C39 Given a word, the learner will identify its syllabication.
- 1C40 Given a word, the learner will identify its primary accented syllable.

PUNCTUATION AND CAPITALIZATION

- 1C41 Given sentences, the learner will identify the correct use of a period, a question mark, or a comma.
- 1C42 Given sentences, the learner will identify the correct use of a colon, a semicolon, or quotation marks.
- 1C43 Given sentences, the learner will identify the correct use of capital letters for a proper name, a place name, or a book title.

VOCABULARY

SYNONYMS, ANTONYMS, HOMONYMS, AND HOMOGRAPHS

- 1D1 Given a word, the learner will identify its synonym.
- 1D2 Given a word, the learner will identify its antonym.
- 1D3 Given a pair of words, the learner will identify the words as synonyms, antonyms, or neither.
- 1D4 Given a homonym, the learner will identify the word that has the same pronunciation.
- 1D5 Given a homonym in context, the learner will identify the meaning of the homonym.
- 1D6 Given a homograph in context, the learner will identify the meaning of the homograph.

CONTEXT CLUES

- 1D7 Given an unfamiliar word in context, the learner will identify the meaning of the word.
- 1D8 Given a sentence with a word omitted, the learner will use context clues to identify a word to correctly complete the sentence.

FIGURATIVE LANGUAGE

- 1D9 Given a sentence with a simile, the learner will identify the meaning of the simile.
- 1D10 Given a sentence with a metaphor, the learner will identify the meaning of the metaphor.
- 1D11 Given a sentence with personification, the learner will identify the meaning of the personification.

ABBREVIATIONS

- 1D12 Given an abbreviation, the learner will identify the word that the abbreviation represents.

SYMBOLS

- 1D13 Given a numeral or a symbol, the learner will identify the meaning of the numeral or symbol.

COMPREHENSION

LISTENING COMPREHENSION

- 1E1 Orally given a story, the learner will identify an illustration of the main idea in the story.
- 1E2 Orally given a story, the learner will identify an illustration of a detail in the story.
- 1E3 Orally given a story, the learner will identify an illustration of the main events in the story.
- 1E4 Orally given a story, the learner will identify an illustration of a conclusion based on the material in the story.

LITERAL COMPREHENSIONClassifying

- 1E5 Given a set of words, the learner will identify the word that is not related.
- 1E6 Given a set of words that are related, the learner will identify the word that describes their classification.

Main Idea

- 1E7 Given a reading selection, the learner will identify the main idea.
- 1E8 Given a reading selection, the learner will identify an appropriate title.

Details

- 1E9 Given a reading selection, the learner will identify a detail from the material in the selection.

Sequence

- 1E10 Given a reading selection, the learner will identify the sequence of the main events.

Paraphrasing and Summarization

- 1E11 Given a sentence, the learner will identify its paraphrase.
- 1E12 Given a reading selection, the learner will identify a sentence that summarizes it.

INFERENTIAL COMPREHENSIONDrawing Conclusions

- 1E13 Given a reading selection, the learner will identify a conclusion based on the material in the selection.

Characters' Emotions

- 1E14 Given a reading selection, the learner will identify the emotions of characters.

Cause and Effect

- 1E15 Given a reading selection, the learner will identify a cause-and-effect relationship.

Compare and Contrast

- 1E16 Given a reading selection, the learner will compare or contrast material to identify the correct answer.

Fact and Opinion

- 1E17 Given sentences that are statements of fact or opinion, the learner will identify the sentence that is a statement of opinion.

Author's Purpose and Opinion

- 1E18 Given a reading selection, the learner will identify the author's purpose.
- 1E19 Given a reading selection, the learner will identify the author's opinion.
- 1E20 Given a reading selection, the learner will identify facts the author presented to support his opinion.

Logical Thinking

- 1E21 Given a reading selection and a set of questions, the learner will identify the question that cannot be answered from the material in the selection.
- 1E22 Given a reading selection, the learner will identify the statement that represents illogical thinking.

READING IN THE CONTENT AREASLiterature

- 1E23 Given a fictional story and a set of questions, the learner will identify the setting, theme, and mood of the story.

Natural Sciences

- 1E24 Given a natural science selection and a set of questions, the learner will identify for each question the statement that correctly answers it.

Social Studies

- 1E25 Given a social studies selection and a set of questions, the learner will identify for each question the statement that correctly answers it.

STUDY SKILLS

DICTIONARYAlphabetizing Words

- 1F1 Given a set of words, the learner will identify by second letter the word that comes first in alphabetical order.
- 1F2 Given a set of words, the learner will identify by second and third letters the word that comes first in alphabetical order.
- 1F3 Given a set of words, the learner will identify by third and fourth letters the word that comes first in alphabetical order.

Guide Words

- 1F4 Given a set of guide words, the learner will identify a word that could be found on a particular dictionary page.

Use and Definitions

- 1F5 Given a sample dictionary page and a word in context, the learner will identify the correct definition of the word.
- 1F6 Given a sample dictionary entry, the learner will identify the function (pronunciation, definition, or part of speech) of each part.
- 1F7 Given a sample dictionary page and a word, the learner will identify an antonym for the word.
- 1F8 Given a sample dictionary page and a word, the learner will identify a synonym for the word.

Pronunciation

- 1F9 Given a pronunciation key and a word, the learner will identify the correct pronunciation of the word.
- 1F10 Given a sample dictionary page and a word in context, the learner will identify the correct pronunciation of the word.

ENCYCLOPEDIA

- 1F11 Given an illustration of encyclopedia volumes, the learner will identify the volume that has information on a specific topic.
- 1F12 Given a sentence with a key word, the learner will identify the key word to use to find a topic in an encyclopedia.

CARD CATALOG AND READERS' GUIDE

- 1F13 Given an illustration of a library card catalog, the learner will identify the drawer that has an author, a title, or a subject card.
- 1F14 Given a sample library catalog card, the learner will identify the author, title, or call number of a book.
- 1F15 Given sample entries from the Readers' Guide to Periodical Literature and a topic, the learner will identify a magazine article on the topic.

TITLE PAGE, TABLE OF CONTENTS, INDEX, AND BIBLIOGRAPHY

- 1F16 Given a sample title page, the learner will identify the title, author or publisher.
- 1F17 Given a sample table of contents page, the learner will identify the page, chapter, or section references for a specific topic.
- 1F18 Given a sample index page, the learner will identify page references for a specific topic.
- 1F19 Given a sample bibliography page, the learner will identify a book title, author, or publisher of specific references.

REFERENCE MATERIALS

- 1F20 Given a question on a specific topic, the learner will identify the source (newspaper, telephone book, or timetable) to use to find information on a topic.
- 1F21 Given a question on a specific topic, the learner will identify the source (dictionary, encyclopedia, or card catalog) to use to find information on a topic.
- 1F22 Given a question on a specific topic, the learner will identify the source (almanac, atlas, or thesaurus) to use to find information on a topic.

MAPS, DIAGRAMS, GRAPHS, AND TABLES

- 1F23 Given a sample map, the learner will identify specific information.
- 1F24 Given a sample diagram, the learner will identify specific information.
- 1F25 Given a sample graph, the learner will identify specific information.
- 1F26 Given a sample table, the learner will identify specific information.

OUTLINES

- 1F27 Given a passage and an outline that has topics missing, the learner will identify a main topic, subtopic, or detailed sentence to correctly complete the outline.

APPENDIX 4

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PRIMARY ARITHMETIC OBJECTIVESOBJECTIVE NUMBER

- NN5 Given four numerals, the learner will identify the one that represents a number between 10 and 100 as specified.
- NN7 Given four numerals, the learner will identify the numeral that represents a number greater than 100 and less than 1000 as specified.
- NN15 Given a number less than 9, the learner will identify the number that is one more than the given number.
- NN22 Given a sequence of three consecutive 2-digit numbers, the learner will identify the next number in the sequence.
- NN23 Given a sequence of three consecutive 3-digit numbers, the learner will identify the next number in the sequence.
- NN31 Given a 2-digit number expressed in expanded form (example: 5 tens + 2 ones), the learner will identify the standard numeral for the number.
- NN33 Given a 3-digit number expressed in expanded form (example: 3 hundreds + 5 tens + 7 ones), the learner will identify the standard numeral for the number.
- NN35 Given a picture of more than 10 but less than 100 objects with groups of ten bundled and given four numerals in expanded form (example: 7 tens + 3 ones), the learner will identify the numeral that represents the number of objects pictured.
- NN40 Given pictures of four sets, each with fewer than six objects, the learner will identify the set that has the most or the fewest objects as specified.
- NN42 Given two 2-digit numbers, the learner will identify the inequality sign (or) that indicates their order.
- NN45 Given a picture of a line of four objects facing left, the learner will identify the first, second, third, or fourth object as specified.
- NN47 Given pictures of four regions with a portion of each region shaded, the learner will identify the region that is one-half shaded.
- NN53 Given a picture of a region divided into three or four congruent parts with two or more parts shaded, the learner will identify the fraction that indicates the shaded portion.

OBJECTIVE NUMBER

- CP3 Given an addition problem in horizontal format with two 1-digit addends whose sum is less than 6, the learner will identify the sum.
- CP5 Given an addition problem in horizontal format with two 1-digit addends whose sum is 6 or 7, the learner will identify the sum.
- CP7 Given an addition problem in horizontal format with two 1-digit addends whose sum is 8 or 9, the learner will identify the sum.
- CP9 Given an addition problem in horizontal format with two 1-digit addends whose sum is 10 or 11, the learner will identify the sum.
- CP11 Given an addition problem in horizontal format with two 1-digit addends whose sum is 12, 13, or 14, the learner will identify the sum.
- CP13 Given an addition problem in horizontal format with two 1-digit addends whose sum is 15, 16, 17, or 18, the learner will identify the sum.
- CP18 Given an addition problem in vertical format involving three 1-digit numbers such that the sum of the first two numbers is less than 19, the learner will identify the sum.
- CP23 Given an addition problem involving a 1-digit number, a 2-digit number, and one regrouping, the learner will identify the sum.
- CP24 Given an addition problem involving two 2-digit numbers and no regrouping, the learner will identify the sum.
- CP25 Given an addition problem involving two 2-digit numbers and one regrouping, the learner will identify the sum.
- CP27 Given an addition problem involving three 2-digit numbers whose sum is less than 100, without regrouping, the learner will identify the sum.
- CP33 Given an oral word problem that can be solved by adding two 1-digit numbers, the learner will identify the solution.
- CP34 Given a written word problem that can be solved by adding two 1-digit numbers, the learner will identify the solution.

OBJECTIVE NUMBER

- CP37 Given a subtraction problem in horizontal format with a sum less than 6, the learner will identify the difference.
- CP39 Given a subtraction problem in horizontal format with a sum of 6 or 7, the learner will identify the difference.
- CP41 Given a subtraction problem in horizontal format with a sum of 8 or 9, the learner will identify the difference.
- CP43 Given a subtraction problem in horizontal format with a sum of 10 or 11, a 1-digit addend, and a 1-digit difference, the learner will identify the difference.
- CP45 Given a subtraction problem in horizontal format with a sum of 12, 13, or 14, a 1-digit addend, and a 1-digit difference, the learner will identify the difference.
- CP47 Given a subtraction problem in horizontal format with a sum of 15, 16, 17, or 18, a 1-digit addend, and a 1-digit difference, the learner will identify the difference.
- CP55 Given a subtraction problem involving a 1-digit number, a 2-digit number, and regrouping, the learner will identify the difference.
- CP57 Given a subtraction problem involving two 2-digit numbers and regrouping, the learner will identify the difference.
- CP63 Given a written word problem that can be solved by using a subtraction fact, the learner will identify the solution.

OBJECTIVE NUMBER

- MS5 Given a picture of an object aligned with an "arbitrary unit ruler" formed by a line of objects identical to one another (example: paper clips), the learner will identify the length of the object in terms of the arbitrary unit.
- MS6 Given a picture of an object that is a whole number of centimeters long and is aligned with a centimetre ruler, the learner will identify the length of the object.
- MS8 Given a picture of an object that is a whole number of inches long and is aligned with an inch ruler, the learner will identify the length of the object.
- MS12 Given a picture of a clock showing an hour and given four times stated as "____ o'clock," the learner will identify the time shown on the clock.
- MS15 Given a picture of a clock showing a time that is a multiple of five minutes after an hour and given four times stated with the use of a colon, the learner will identify the time shown.
- MS19 Given a picture of a nickel or dime and four pictures of coins (pennies, nickels, and dimes), the learner will identify the one of the four pictures in which the coins have the same value as the first coin shown.
- MS21 Given a picture of a set of coins (pennies, nickels, and dimes) with a total value of less than 50¢, the learner will identify the amount shown.
- MS24 Given a picture of pennies, nickels, dimes, and quarters with a total value of less than one dollar, the learner will identify the number of cents pictured.
- MS26 Given a picture of an article with a price tag of more than 15¢ and less than 99¢ and pictures of four sets of coins (pennies, nickels, dimes, and quarters), the learner will identify the set of coins that will exactly pay for the article.

OBJECTIVE NUMBER

- SG2 Given a picture of a sequence of geometric figures in which a pattern has been established, the learner will identify the next figure in the sequence.
- SG23 Given a picture of an object and pictures of a cube, a sphere, a cone, and a cylinder, the learner will identify the one of the four figures that is the basic shape of the object.

WHOLE NUMBERSCONCEPTS AND NOTATION

- W1 The learner will identify the next number in a sequence of consecutive 3-digit numbers.
- W2 The learner will identify the next number in a sequence of numbers formed by skip-counting by 2, 5, or 10.
- W3 The learner will identify the word name for a 3- or 4-digit numeral.
- W4 The learner will identify the word name for a 5-, 6-, or 7-digit numeral.
- W5 Given two numbers greater than 10 and less than 1000, the learner will select the inequality sign that indicates their order.
- W6 Given two numbers greater than 1000 and less than 1,000,000, the learner will select the inequality sign that indicates their order.
- W7 Given different arrangements of three numbers less than 1000, the learner will select the arrangement in which the numbers are listed in order from least to greatest.
- W8 Given different arrangements of four numbers greater than 1000 and less than 1,000,000, the learner will select the arrangement in which the numbers are listed in order from least to greatest.
- W9 Given a segment of a whole number line with the 1- or 2-digit numeral that labels one point missing, the learner will identify the missing numeral.
- W10 Given the expanded numeral for a 3- or 4-digit number, the learner will identify the standard numeral for that number. (Example of the form of the expanded numeral: $700 + 20 + 5$)
- W11 The learner will identify the place value of a digit in a 4-digit numeral.

- W12 The learner will identify the place value of a digit in a 5-, 6-, or 7-digit numeral.
- W13 Given the Roman numeral for a number less than 40, the learner will identify the Arabic numeral for the number.
- W14 Given the Roman numeral for a number less than 4000, the learner will identify the Arabic numeral for the number.
- W15 Given a sequence of consecutive 2-, 3-, or 4-digit numbers in base two or base four, the learner will identify the next number.
- W16 The learner will identify the place value of a digit in a 4-digit numeral in base two, base four, or base five.
- W17 Given the base-two or base-eight numeral for a number less than 64, the learner will identify the base-ten numeral for that number.
- W18 Given a base-ten numeral for a number less than 64, the learner will identify the base-two numeral for that number.
- W19 The learner will recognize the approximation of a given 4-digit number to the nearest thousand, hundred, or ten.
- W20 The learner will recognize the approximation of a given 8-digit number to the nearest million, ten thousand, or hundred.
- W21 The learner will identify the square of a 1-digit number.
- W22 The learner will identify the cube of a 1-digit number.
- W23 The learner will identify the standard numeral for a power with a base and an exponent less than 6.
- W24 The learner will identify the square root of a perfect square less than 145.

OPERATIONSComputation

- W25 The learner will add two 1-digit numbers.
(Addition facts)
- W26 The learner will add two 2-digit numbers with no regrouping.
- W27 The learner will add three 2-digit numbers with no regrouping.
- W28 The learner will add two 2-digit numbers with regrouping.
- W29 The learner will add three 2-digit numbers with regrouping.
- W30 The learner will add two 3-digit numbers with regrouping.
- W31 The learner will add two numbers greater than 1000 and less than 10,000,000.
- W32 The learner will add three numbers greater than 100 and less than 10,000.
- W33 Given a subtraction problem with a 1- or 2-digit minuend, a 1-digit subtrahend, and a 1-digit difference, the learner will identify the difference. (Subtraction facts)
- W34 The learner will subtract a 2-digit number from a 2-digit number with no regrouping.
- W35 The learner will subtract a 1- or 2-digit number from a 2-digit number with regrouping.
- W36 The learner will subtract a 2-digit number from a 3-digit number with regrouping.
- W37 The learner will subtract a 3-digit number from a 3-, 4-, or 5-digit number with regrouping.
- W38 The learner will subtract a 4- or 5-digit number from a 5-, 6-, or 7-digit number with regrouping.

- W39 The learner will multiply two 1-digit numbers.
(Multiplication facts)
- W40 The learner will multiply a 2-digit number and a 1-digit number with no regrouping.
- W41 The learner will multiply a 2-digit number and a 1-digit number with regrouping.
- W42 The learner will multiply a 3-digit number and a 1-digit number with regrouping.
- W43 The learner will multiply two 2-digit numbers.
- W44 The learner will multiply a 3-digit number and a 2-digit number.
- W45 The learner will multiply two 3-digit numbers.
- W46 The learner will multiply a 4- or 5-digit number and a 3- or 4-digit number.
- W47 Given a division problem with a 1- or 2-digit dividend, a 1-digit divisor, a 1-digit quotient, and no remainder, the learner will identify the quotient. (Division facts)
- W48 Given a division problem with a 2-digit dividend, a 1-digit divisor, and a 2-digit quotient with no regrouping and no remainder, the learner will identify the quotient.
- W49 The learner will divide a 2-digit number by a 1-digit number with regrouping and no remainder.
- W50 The learner will divide a 2-digit number by a 1-digit number with regrouping and a remainder.
- W51 The learner will divide a 3-digit number by a 1-digit number with no remainder.
- W52 The learner will divide a 3-digit number by a 1-digit number with a remainder.
- W53 The learner will divide a 2-digit number by a 2-digit number with no remainder.

WHOLE NUMBERS

- W54 The learner will divide a 2-digit number by a 2-digit number with a remainder.
- W55 The learner will divide a 3- or 4-digit number by a 2-digit number with a remainder.
- W56 The learner will divide a 3-, 4-, or 5-digit number by a 3-digit number with a remainder.

Concepts of Operations

- W57 Given a number line on which an addition problem is illustrated, the learner will identify the addition problem.
- W58 Given a number line on which a subtraction problem is illustrated, the learner will identify the subtraction problem.
- W59 Given a number line on which a multiplication problem is illustrated, the learner will identify the multiplication problem.
- W60 Given a number line on which a division problem is illustrated, the learner will identify the division problem.
- W61 The learner will recognize the answer to an addition problem with 0 as an addend or a multiplication problem with 0 or 1 as a factor.
- W62 Given the product of a whole number and a sum of two whole numbers, the learner will identify the sum that is equal to this product. (Application of the distributive property)
- W63 The learner will evaluate an expression involving two or more operations and parentheses.
- W64 Given an addition problem with addends less than 1000, the learner will identify the sum that is used to estimate the answer.
- W65 Given a subtraction problem with minuend and subtrahend less than 1000, the learner will identify the difference that is used to estimate the answer.

- W66 Given a multiplication problem with factors less than 1000, the learner will identify the product that is used to estimate the answer.
- W67 Given a division problem with dividend and divisor less than 1000, the learner will identify the quotient that is used to estimate the answer.

WORD PROBLEMS AND NUMBER SENTENCES

- W68 Given a one-step word problem that can be solved by addition or subtraction, the learner will identify the addition or subtraction sentence that is used to solve the problem.
- W69 Given a one-step word problem that can be solved by addition or subtraction, the learner will solve the problem.
- W70 Given a one-step word problem that can be solved by multiplication or division, the learner will identify the multiplication or division sentence that is used to solve the problem.
- W71 Given a one-step word problem that can be solved by multiplication or division, the learner will solve the problem.
- W72 The learner will solve a one-step word problem with extraneous information.
- W73 The learner will solve a two-step word problem.
- W74 Given an open addition sentence involving a 1-digit addend and a missing 1-digit addend, the learner will identify the missing addend.
- W75 Given an open addition sentence involving 2-digit numbers, the learner will identify the missing addend.
- W76 Given an open subtraction sentence involving a 1-digit subtrahend and a 1-digit difference, the learner will identify the missing minuend.

- W77 Given an open subtraction sentence involving 2-digit numbers, the learner will identify the missing minuend.
- W78 Given an open multiplication sentence involving a 1-digit factor and a missing 1-digit factor, the learner will identify the missing factor.
- W79 Given an open multiplication sentence involving a 1-digit factor and a missing 2-digit factor, the learner will identify the missing factor.
- W80 Given an open division sentence involving a 1-digit divisor and a 1-digit quotient, the learner will identify the missing dividend.
- W81 Given an open division sentence involving a 1-digit divisor and a 2-digit quotient, the learner will identify the missing dividend.
- W82 Given two numbers, each of which is expressed as a sum or difference, the learner will select the inequality or equality sign that indicates their order.
- W83 Given two numbers, each of which is expressed as a product or quotient, the learner will select the inequality or equality sign that indicates their order.

NUMBER THEORY

- W84 Given a list of odd and even numbers, the learner will select the one number in the list that is odd or even.
- W85 The learner will identify the next number in a sequence of numbers formed by addition or multiplication.
- W86 Given a list of numbers, the learner will identify the one number in the list that is a factor of a given number.
- W87 The learner will identify the greatest common factor of two 2-digit numbers.

WHOLE NUMBERS

- W88 Given a list of numbers, the learner will identify the one number in the list that is a multiple of a given number.
- W89 The learner will identify the least common multiple of two 1- or 2-digit numbers.
- W90 Given a list of numbers, the learner will select the one number in the list that is a prime number or a composite number.
- W91 The learner will identify the prime factorization of a 2- or 3-digit number.

FRACTIONAL NUMBERS*

CONCEPTS AND NOTATION

- F1 Given a region divided into 2, 4, or 5 congruent parts, the learner will identify the fraction that describes the shaded part of the region.
- F2 The learner will recognize the fraction that represents the quotient of two non-zero whole numbers.
- F3 Given a proper fraction with 3, 4, or 5 as denominator, the learner will identify the point associated with it on the number line.
- F4 Given a mixed number, the learner will identify the point associated with it on the number line.
- F5 Given a list of fractions, the learner will identify the fraction that is equivalent to a given fraction.
- F6 The learner will identify the simplest form of a given fraction.
- F7 Given two fractions with like denominators, the learner will select the inequality or equality sign that indicates their order.
- F8 Given different arrangements of four fractions with like denominators, the learner will select the arrangement in which the fractions are listed in order from least to greatest.
- F9 Given two fractions with unlike denominators, the learner will select the proper inequality or equality sign that indicates their order.
- F10 The learner will identify the least common denominator of two given fractions.
- F11 The learner will identify the mixed number that is equivalent to a given fraction or the fraction that is equivalent to a given mixed number.

*The items for the objectives in this section contain no negative numbers.

FRACTIONAL NUMBERS

- F12 Given a 1-place decimal, the learner will identify the point associated with it on the number line.
- F13 The learner will identify the place value of a digit in a 3-place decimal.
- F14 The learner will identify the 2- or 3-place decimal numeral for a number expressed in expanded notation. (Example of the form of the expanded numeral: $3 \times 10 + 6 + 7 \times \frac{1}{10} + 4 \times \frac{1}{100}$)
- F15 Given two decimals, each with 1, 2, or 3 places, the learner will select the inequality sign that indicates their order.
- F16 Given different arrangements of four decimals, each with 1, 2, or 3 places, the learner will select the arrangement in which the decimals are listed in order from least to greatest.
- F17 The learner will identify the terminating decimal that is equivalent to a given fraction.
- F18 The learner will identify the repeating decimal that is equivalent to a given fraction.
- F19 The learner will identify the fraction that is equivalent to a given terminating decimal.
- F20 The learner will identify the fraction that is equivalent to a given repeating decimal.
- F21 The learner will recognize the approximation of a decimal to the nearest tenth, hundredth, or thousandth.
- F22 The learner will recognize the scientific notation for a number greater than ten.
- F23 Given a table of square roots, the learner will identify the square root of a number.
- F24 Given a list of numbers, the learner will select the number that is the best approximation of the square root of a 2- or 3-digit whole number.

FRACTIONAL NUMBERS

OPERATIONSComputation

- F25 The learner will add two fractions with like denominators.
- F26 The learner will add two fractions where the denominator of one fraction is a multiple of the denominator of the other fraction.
- F27 The learner will add two fractions with unlike denominators.
- F28 The learner will add two mixed numbers with no regrouping.
- F29 The learner will add two mixed numbers with regrouping.
- F30 The learner will subtract two fractions with like denominators.
- F31 The learner will subtract two fractions with unlike denominators.
- F32 The learner will subtract two mixed numbers with no regrouping.
- F33 The learner will subtract two mixed numbers with regrouping.
- F34 The learner will multiply a whole number and a fraction.
- F35 The learner will multiply two fractions.
- F36 The learner will multiply a mixed number and a whole number.
- F37 The learner will multiply two mixed numbers.
- F38 The learner will divide a fraction by a whole number.
- F39 The learner will divide a fraction by a fraction.

FRACTIONAL NUMBERS

- F40 The learner will divide a mixed number by a mixed number.
- F41 Given a problem presented in vertical form, the learner will add two decimals, each with 1, 2, or 3 places.
- F42 Given a problem presented in horizontal form, the learner will add two decimals, each with 1, 2, or 3 places.
- F43 Given a problem presented in vertical form, the learner will subtract a 1-, 2-, or 3-place decimal from a 2- or 3-place decimal.
- F44 Given a problem presented in horizontal form, the learner will subtract a 1-, 2-, or 3-place decimal from a 2- or 3-place decimal.
- F45 The learner will multiply a 1-, 2-, or 3-place decimal and a whole number.
- F46 The learner will multiply two decimals, each with 2 or 3 places.
- F47 The learner will divide a 1-, 2-, or 3-place decimal by a whole number with no remainder.
- F48 The learner will divide a 1-, 2-, or 3-place decimal by a 1-, 2-, or 3-place decimal with no remainder.
- F49 The learner will divide a 1-, 2-, or 3-place decimal by a 1-, 2-, or 3-place decimal, rounding the quotient to a given decimal place.

Concepts of Operations

- F50 The learner will evaluate an expression involving two or more operations and parentheses.
- F51 The learner will recognize the answer to an addition problem with 0 as an addend or a multiplication problem with 0 or 1 as a factor.

FRACTIONAL NUMBERS

- F52 The learner will identify the missing factor in an open sentence of the form $a \times \square = 1$, where a is a fraction or whole number.
- F53 Given the product of a fraction and a sum of fractions, the learner will identify the sum that is equal to this product. (Application of the distributive property)
- F54 The learner will identify the reciprocal of a given fraction or whole number.
- F55 Given a list of equations containing no variables, the learner will identify the equation that is an application of the commutative, the associative, or the distributive property.

WORD PROBLEMS AND NUMBER SENTENCES

- F56 Given a one-step word problem that can be solved by addition or subtraction, the learner will solve the problem.
- F57 Given a one-step word problem that can be solved by multiplication or division, the learner will solve the problem.
- F58 The learner will solve a two-step word problem.
- F59 Given a one-step cost problem that can be solved using ratios, the learner will solve it.
- F60 The learner will solve a rate-time-distance problem.
- F61 Given the scale of a map and the distance between the points representing two cities on the map, the learner will compute the actual distance between the two cities.
- F62 Given the original cost and the percent of increase or decrease, the learner will find the new cost.
- F63 Given a word problem involving the percent of interest on savings or on a loan, the learner will compute the amount of interest.

RATIO, PROPORTION, AND PERCENT

- F64 The learner will identify the ratio that describes a comparison of two quantities.
- F65 Given a list of ratios, the learner will identify the ratio that is equivalent to a given ratio.
- F66 Given three numbers of a proportion, the learner will identify the missing number.
- F67 The learner will identify the percent that is equivalent to a given 1- or 2-place decimal.
- F68 The learner will identify the percent that is equivalent to a given 3-place decimal.
- F69 Given a percent that is equivalent to a 1- or 2-place decimal, the learner will identify the decimal that is equivalent to the given percent.
- F70 Given a percent that is equivalent to a 3-place decimal, the learner will identify the decimal that is equivalent to the given percent.
- F71 Given a percent involving a whole number less than 100, the learner will identify the simplest form of the fraction that is equivalent to the percent.
- F72 The learner will identify the percent that is equivalent to a given proper fraction whose denominator is a factor of 100.
- F73 The learner will identify the percent that is equivalent to a given ratio whose second term is a factor of 100.
- F74 The learner will identify a given percent of a given number.
- F75 Given whole number values for a, b, c, d, e, and f, the learner will solve a problem of the form "a is b% of □", c is □% of d", or "□ is e% of f."

MEASUREMENTLENGTH, ANGLE, WEIGHT, AND LIQUID MEASUREMENT

- M1 Given pictures of an object and a ruler having non-standard units with one end of the object and one end of the ruler aligned, the learner will identify the length of the object.
- M2 Given pictures of an object and a centimetre ruler with one end of the object and one end of the ruler aligned, the learner will identify the length of the object.
- M3 Given pictures of an object and a centimetre ruler with one end of the object and one end of the ruler aligned, the learner will identify the length of the object to the nearest centimetre, .5 centimetre, or .1 centimetre.
- M4 Given pictures of an object and an inch ruler with one end of the object and one end of the ruler aligned, the learner will identify the length of the object to the nearest inch, one-half inch, or one-fourth inch.
- M5 Given an angle with the picture of a half-circle protractor superimposed on it, the learner will determine the degree measure of the angle by subtracting.
- M6 Given an angle and a set of angles with the degree measures of all the angles indicated, the learner will select the angle that is congruent to a given angle.
- M7 Given a list of metric units including the centimetre, the metre, and the kilometre, the learner will determine the appropriate unit to use to measure a specified object or distance.
- M8 Given a list of customary units including the inch, the foot, and the mile, the learner will determine the appropriate unit to use to measure a specified object or distance.

MONEY, TIME, AND TEMPERATURE

- M27 Given a certain number of quarters, dimes, nickels, and pennies whose total value is less than one dollar, the learner will identify the total value of the coins in cents.
- M28 Given the prices of two or three items expressed with dollar signs and decimal points, the learner will identify the total cost.
- M29 Given the cost of an item expressed with a dollar sign and a decimal point and the amount of money given to the clerk, the learner will identify the amount of change.
- M30 Given the cost of a single item expressed with a dollar sign and a decimal point, the learner will identify the total cost of a number of these items.
- M31 Given the total cost of a number of identical items expressed with a dollar sign and a decimal point, the learner will identify the cost of a single item.
- M32 Given a list of times expressed with colons and a picture of a clock, the learner will identify the time shown.
- M33 Given a word problem involving only "p.m." time measurements, the learner will solve the problem by adding or subtracting.
- M34 Given a word problem involving "a.m." and "p.m." time measurements, the learner will solve the problem by adding or subtracting.
- M35 Given a Fahrenheit temperature and a number of degrees that the temperature rises or falls, the learner will identify the resulting temperature.
- M36 Given a Celsius (centigrade) temperature and a number of degrees that the temperature rises or falls, the learner will identify the resulting temperature.
- M37 Given the appropriate conversion formula, the learner will convert a Fahrenheit temperature to a Celsius (centigrade) temperature and a Celsius temperature to a Fahrenheit one.
- M38 The learner will convert a Fahrenheit temperature to a Celsius (centigrade) temperature and a Celsius temperature to a Fahrenheit one.

APPENDIX 5

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WORKSHOP I

IN-SERVICE MEETING
PERCEPTION WORKSHOP
READING, MATHEMATICS TEACHERS

Thursday, October 12, 1978
Allegheny Center Two
Conference Room
12:30 - 3:30

Agenda

- 12:30 - 12:40 Overview of Workshop activities - Corinne Piatt
- 12:40 - 1:30 Skills in Auditory and Visual - Whole Group Perception-Overhead
- Three Exercises - with Perception Vocabulary
- 1:30 - 2:15 Generate list of appropriate materials.
Divide into two groups -- visual and auditory.
Subdivide into reading and math. Select a recorder for your group.
- 2:15 - 3:15 Demonstration of Slingerland - Cindy Rush
- 3:15 - 3:30 Wrap-up and Evaluation

GUIDELINES FOR THE IDENTIFICATION
AND AMELIORATION OF PROBLEMS IN
PERCEPTION IN THE READING AND
MATHEMATICS PROGRAM

I. Pre-Requisite Skills for Reading and Math

A. Terms and Definitions

1. Visual discrimination of structural details is the recognition of (matching and/or choosing) parts of words, or parts of a number sentence.
2. Visual discrimination of orientation is the directionality of specific numbers and letters: d-b, p-q.
3. Visual discrimination of sequence is the recognition of the order of letters and/or numbers.
4. Visual memory is the ability to recall visual stimuli.
5. Auditory discrimination is the ability to recognize (match, differentiate) auditory stimuli.
6. Auditory analysis consists of breaking down words into their component sounds.
7. Auditory synthesis refers to the ability to blend sounds to form words.
8. Auditory memory is the recall of auditory stimuli, such as a group of spoken words to numbers.
9. Visual figure-ground discrimination is the ability to attend to the visual stimulus object, the word(s) or number(s), while blocking out the background.
10. Auditory figure-ground discrimination is the ability to attend to the stimulus sound and to block out extraneous sounds.
11. Auditory sequencing is the ability to recognize the order of sounds in words, words in sentences, etc.
12. Auditory attention is the ability to attend to the auditory stimuli for a sustained period of time.
13. Visual attention is the ability to attend to visual stimuli for a sustained period of time.

SKILLS IN VISUAL AND AUDITORY PERCEPTION

By working through this exercise, you will become familiar with some of the terms used to identify skills within the areas of visual and auditory perception. Use the following abbreviations for the terms:

Visual Discrimination of Structural Details	V D Str D
Visual Discrimination of Orientation	V D Or
Visual Discrimination of Sequence	V D Seq
Visual Memory	V Mem
Visual Figure-Ground Discrimination	V Fig-Gr
Visual Attention	V Atten
Auditory Discrimination	A Dis
Auditory Analysis	A Analy
Auditory Synthesis	A Syn
Auditory Sequence	A Seq
Auditory Memory	A Mem
Auditory Figure-Ground Discrimination	A Fig-Gr
Auditory Attention	A Atten

Identify each behavior as one of the perception skills listed above. Use abbreviations. There is one behavior for each skill.

- _____ 1. Confuses d and b; p and q.
- _____ 2. Distinguishes between the letter A and the numeral 4.
- _____ 3. Arranges magnetic numerals in order.
- _____ 4. Writes four-digit numeral that has been flashed momentarily.
- _____ 5. Looks into the eyes of the speaker.
- _____ 6. Traces over numerals which are superimposed one upon another.

- _____ 1. Listens for the words of a song.
- _____ 2. Recognizes a wrong tone or "clinker" in a melody.
- _____ 3. Identifies the sounds in a spoken word.
- _____ 4. Repeats a ten-word sentence after hearing it spoken.
- _____ 5. Identifies the two rhyming words in a group of three spoken words.
- _____ 6. Waits for the next "Simon says" direction.
- _____ 7. Combines sounds to make a word.

Check your answers against the key on page 4.

SKILLS IN VISUAL PERCEPTION

Read each behavior. Identify it according to the visual skills listed on the preceding page. Each skill has three behaviors that exemplify the skill. Label each behavior with the abbreviation of the skill it best exemplifies.

- _____ 1. Looks into the eyes of the speaker.
- _____ 2. Names a four-digit number that has been flashed momentarily.
- _____ 3. Confuses d and b; p and q.
- _____ 4. Arranges magnetic numerals in order.
- _____ 5. Locates a specific item in a collage.
- _____ 6. Locates two identical birds among a group of four.
- _____ 7. Names items which have been shown for a few seconds and then removed from sight.
- _____ 8. Watches an ant carry away a food particle.
- _____ 9. Identifies a hidden figure in a drawing.
- _____ 10. Confuses letters r and n; n and h; a and d.
- _____ 11. Distinguishes between the letter A and the numeral 4.
- _____ 12. Numerals are written in a neat column.
- _____ 13. Recites the numerals and letters on a license plate that has just passed by.
- _____ 14. Orders a set of objects from smallest to largest.
- _____ 15. Watches the television screen intently.
- _____ 16. Traces over numerals which are superimposed one upon another.
- _____ 17. Traces over an outline of a frog.
- _____ 18. Maintains a left margin on a written paper.

Check your answers against the key on page 4.

SKILLS IN AUDITORY PERCEPTION

Read each behavior. Identify it according to the auditory skills listed on the preceding page. Each skill has three behaviors as examples of the skill. Label each behavior with the abbreviation of the skill it best exemplifies.

- _____ 1. Identifies the two words that rhyme when given a series of three words.
- _____ 2. Combines sounds to make a word.
- _____ 3. Identifies the number of syllables or parts in a spoken word.
- _____ 4. Listens attentively to the story-teller.
- _____ 5. Hears whispered secret above the playground noise.
- _____ 6. Follows the next "Simon says" order correctly.
- _____ 7. Adds ing to a spoken word.
- _____ 8. Writes correctly a five-digit numeral which has been dictated.
- _____ 9. Identifies the phonemes in a spoken word.
- _____ 10. Identifies the louder of two sounds.
- _____ 11. Hears the difference between the words forty and fourteen.
- _____ 12. Combines letter sounds to make "nonsense" words.
- _____ 13. Writes number sentences from dictation.
- _____ 14. Recognizes a "clinker" or wrong tone when musician plays a melody.
- _____ 15. Hears the words of a song on the radio.
- _____ 16. Waits without talking for the next "Simon says" direction.
- _____ 17. Listens to the background music rather than the actors' dialogue during a film.
- _____ 18. Hears the incongruity in "up-down-sided".
- _____ 19. Listens as teacher dictates the next multiplication problem.
- _____ 20. Anticipates the last word in a spoken verse.
- _____ 21. Identifies the suffix in a spoken word.

Check your answers against the key on page 4.

KEY

SKILLS IN VISUAL AND AUDITORY PERCEPTION

Exercise 1

1. V D Or
2. V D Str D
3. V D Seq
4. V Mem
5. V Attn
6. V Fig-Gr

1. A Fig-Gr
2. A Seq
3. A Analy
4. A Mem
5. A Dis
6. A Attn
7. A Syn

Exercise 2

1. V Attn
2. V Mem
3. V Or
4. V Seq
5. V Fig-Gr
6. V D Str D
7. V Mem

8. V Attn
9. V Fig-Gr
10. V D Str D
11. V D Str D
12. V Or
12. V Mem
14. V Seq
15. V Attn
16. V Fig-Gr
17. V Seq
18. V Or

Exercise 3

1. A Dis
2. A Syn
3. A Analy
4. A Attn
5. A Fig-Gr
6. A Mem
7. A Syn
8. A Mem
9. A Analy
10. A Dis
11. A Dis
12. A Syn
13. A Mem
14. A Seq
15. A Fig-Gr
16. A Attn
17. A Fig-Gr
18. A Seq
19. A Attn
20. A Seq
21. A Analy

VISUAL PERCEPTION WORKSHEET

Visual discrimination of structural details

Visual discrimination of orientation

Visual discrimination of sequence

Visual memory

Visual figure-ground discrimination

Visual attention

AUDITORY PERCEPTION WORKSHEET

Auditory discrimination

Auditory analysis

Auditory synthesis

Auditory memory

Auditory figure-ground discrimination

Auditory sequencing

Auditory attention

IN-SERVICE MEETING
PERCEPTION WORKSHOP
READING, MATHEMATICS TEACHERS

Thursday, October 12, 1978
Two Allegheny Center
Conference Room B
12:30 - 3:00

Evaluation

- OBJECTIVES:
1. To identify skills in visual and auditory perception.
 2. To identify behaviors which indicate deficits in visual and auditory perception.
 3. To identify teaching strategies that can be used to strengthen perceptual skills.

EVALUATION: 1. Which objectives were met? Not met?

2. What experiences can apply in your instructional program?

3. What else do we need to work on in the area of perception?

4. Negative comments should be made here. What could have been done better? Give suggestions for improvement.

5. Indicate your needs for future in-service programs.

WORKSHOP II

IN-SERVICE MEETING
MODALITY WORKSHOP
READING, MATHEMATICS TEACHERS

Friday, November 4, 1978
Two Allegheny Center
Conference Center
12:30 - 3:30

Agenda

- | | |
|---------------|--|
| 12:30 - 12:40 | Overview of Workshop Activities |
| 12:40 - 2:00 | Overview of Non-Public Schools LD Program -
Lucy Naughton |
| | Identifying the Child's Learning Modality -
Lucy Naughton |
| 2:00 - 2:40 | Discuss case study information in small groups |
| 2:40 - 3:15 | Review case studies in each discipline group. Choose
one that appears to be most extreme. Present it to
total group. Fifteen minute time limitation on each. |
| 3:15 - 3:30 | Wrap-up and Evaluation |

OBSERVATION POINTERS TO LEARNER TYPES
AND ADJUSTMENT TECHNIQUES

I. THE VISUAL LEARNER

A. How to Spot the Visual Learner

1. Likes to look at books and pictures - stays with a book, not just manipulating books on and off the shelves.
2. Loves to look at orderly things - demands neat surroundings.
3. Can find what others have lost, remembers where they have seen things.
4. See details - how you dress, if the slip is showing errors on typing, etc.
5. Can find page in book or workbook readily - may have it half done before others start.
6. Can't get directions orally (if the child is timid, will copy from others rather than ask for more directions). Does better if shown.
7. Likes to work puzzles.
8. Probably will be able to make good pictures - at least ones with good balance.
9. Can set the table correctly, etc.
10. May have speech problems.
11. May watch teacher's face intently.
12. Rarely talks in class - or responds in as few words as possible.
13. Possibly hyperactive.

B. How to Make Adjustments for the Child with Visual Modality Weakness

1. Take out visual distractions. It is impossible to take visuals out of the regular classroom but try to place the child where he is not bombarded by too many visual items. (He just swims visually in an overloaded situation).
2. Leave a frame of blank wall around visual displays.
3. On worksheets put a heavy line around items to help pupil to attend to one item at a time. (This can often be done to existing ditto sheets. This does not prevent the use of the worksheet with other children).

4. Give him a BIG marker.
5. Allow him to point if necessary. Let him touch the first letter of every word.
6. Have him clear the table top (desk top).
7. Let the child get one worksheet at a time from stacks rather than hand the child several papers at once. Also give the child a purpose for moving about a bit as he turns in the completed paper and picks up his next sheet from the next stack.
8. Try not to stand in front of too cluttered background when instructing him. (For some children, it may be necessary for the teacher to wear more simple clothing).
9. Give one step at a time.

C. How to Teach to the Child with Strong Visual Modality

1. Give lots of visual directions.
2. Give demonstrations.
3. Use matching games - Jigsaw matching of words, prefixes, suffixes, etc.
4. Charts and graphs.
5. Maps and the use of the legend on map.
6. Color coding systems.
7. Cuisenaire rods.
8. Number frames or abacus.
9. Dictionaries (marking is a code system).
10. Visual symbol for sound (best to have only one key symbol at first).
11. Use configuration clues.
12. Look for words, letters, in papers and magazines.
13. Use mirror to see mouth.
14. Use visual clues for syllables.
15. Use clues such as green dots as place to begin--red dot to stop when establishing directionality.
16. Allow the child to work with rulers and number lines to develop math concepts.
17. The number balance scale is helpful to these children.

II. THE AUDITORY LEARNER

A. How to Spot the Auditory Learner

1. Never shuts up - the chatterer.
2. Tells the jokes - may enjoy the Bennett Cerf type.
3. Tries to be funny.
4. Can win spelling bees if taught say - spell - say method.
5. Good story tellers. Stories get taller and taller. Child may have to learn when to stop.
6. Hyperactive.
7. Poor handwriting - history of reversals.
8. If child can make telephone call asking for information you have directed and remember the received message and relay the message back - good sign of auditory strength.
9. Make good bosses.
10. Likes records, folk dances, rhythmic activities (Note: give the drums, etc. to the auditory learner).
11. Probably has ten excuses for everything.
12. Knows all the words to all the songs - can memorize easily.
13. Motorically awkward.
14. Poor performance on group tests of intelligence.
15. Seem brighter than group test results.
16. Poor perception of time, space.

B. How to Make Adjustment for the Child with Auditory Modality Weakness

1. Take out as much noise as possible.
2. Find him a quiet place to work.
3. Very soft music background may be used but not bouncy music.
4. As a teacher, quit talking so much - don't distract him.
5. Use as few words as you can.

6. If you repeat, use the same words.
7. Speak directly to this child.
8. Ear phones and tape recorder help cut out distraction of other noises.
9. Cup your hand about his ear to help him focus on instruction.

C. How to Teach the Child with Strong Auditory Modality

1. Teach him to talk through tasks.
2. May need to spell out loud.
3. Needs to say syllables out loud.
4. Have him say (name) punctuation mark as he reads to develop an awareness of its function.
5. Play lots of rhyming and blending games.
6. Allow him to think out loud. Encourage oral response.
7. Tape record lessons - tests. Use records.
8. Pair him with a visual learner. Encourage him to use color cues; markers.
9. Use neurological impress method (child points to words while you read to him. You feed the words into the ear).

NAME: _____

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MODALITY: _____

PERCEPTUAL STRENGTHS

PERCEPTUAL WEAKNESSES

MATERIALS AND TECHNIQUES FOR REMEDIATION

IN-SERVICE MEETING
MODALITY WORKSHOP
READING, MATHEMATICS TEACHERS

Friday, November 4, 1978
Two Allegheny Center
Conference Center
12:30 - 3:30

Evaluation

- OBJECTIVES: 1. To identify behaviors which are indicative of a student's dominant learning modality.
2. To identify techniques and materials for instructing auditory learners; visual learners.

EVALUATION: 1. Which objectives were met? Not met?

2. What experiences can you apply to your instructional program?

3. What else do we need to work on in the area of modality?

4. Negative comments should be made here. What could have been done better? Give suggestions for improvement.

5. Indicate your needs or suggestions for future in-service sessions.

WORKSHOP III

IN-SERVICE MEETING
PERCEPTUAL TRAINING WORKSHOP
READING, MATHEMATICS TEACHERS

Wednesday, December 6, 1978
Two Allegheny Center
Conference Center
12:30 - 3:30

Agenda

- | | |
|---------------|---|
| 12:30 - 12:40 | Overview of Workshop Activities |
| 12:40 - 1:00 | Rationale for Perceptual Conditioning in Word Recognition |
| 1:00 - 1:30 | Using the Materials |
| 1:30 - 1:45 | Auditory Analysis and Auditory Synthesis |
| 1:50 - 2:20 | Film: Mathematics at Your Fingertips |
| 2:20 - 2:40 | Experiences with Cuisenaire Rods |
| 2:40 - 3:00 | Flash-X for Visual Skills in Arithmetic |
| 3:00 - 3:15 | The Tape Recorder and the Auditory Learner |
| 3:15 - 3:30 | Wrap-up and Evaluation |

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Gerald G. Glass, "The Teaching of Word Analysis through Perceptual Conditioning," in Teaching Word Recognition Skills compiled by Mildred Dawson (Newark, Delaware: International Reading Association, 1973), pp. 227-230.

GENERAL INFORMATION -- CLASS-ANALYSIS PROGRAM

Categories (vowel clusters)

The word cards are placed in five basic categories according to letter-clusters. The categories are: EASIER, MEDIUM₁, MEDIUM₂, HARDER₁, and HARDER₂. The placement of a letter-cluster within a category is based upon the reported difficulty youngsters experienced while conditioning to the letter-clusters within a whole word.

Classifications (words)

Within each of the five categories, Classification of the words is made. The words which are utilized to condition to each letter-cluster are arranged according to the complexity of the word. The Classifications within each of the five categories are: Simple, Average, and Difficult. (For example, within the EASIER category, in the ad cluster there are three Classifications - Simple (sad, mad, glad), Average (sadness, radish, admit), and Difficult (address, disadvantage, admiration).

(Note: For some of the letter-clusters we were not able to find the appropriate words to form the three (Simple, Average, Difficult) Classifications. Therefore, for some letter-clusters we have fewer Classifications and thus fewer words. We are controlled by the kind and frequency of the letter-clusters discovered within words in the English language.)

In summary, the categories for letter clusters are called EASIER, MEDIUM₁, MEDIUM₂, HARDER₁, and HARDER₂. Within each of the categories we have words that are in the Classifications of simple, Average, and Difficult.

Utilizing Category and Classification for Sequence of Instruction

When instruction is to begin with someone who is just beginning to learn to decode, it is best to utilize the Simple words to teach the letter-clusters within the EASIER category. The student might best complete the Simple classification for all the letter-clusters in the EASIER Kit before moving on to the Average. This will offer to the beginner the easiest task in decoding beyond the level of letter identification.

When instruction is given to students who can already decode at a first grade basal level, it might begin with the Average words within the EASIER category.

On the other hand, if instructing a student who can decode at a second basal level (or above) begin with one of the MEDIUM or HARDER categories utilizing Average or Difficult words.

The teacher will need to discover the appropriate Category and Classification for each child or group, depending upon which word cards seem to be the most productive.

Special caution needs to be taken to make sure that we begin with the easiest material when instructing first or second graders (or illiterate adults) who do not yet have a decoding ability. However, be careful to avoid material that is too easy for students who have already begun to decode. The teacher should, at all times, see herself as a diagnostician who is continually evaluating the appropriateness of the level of words being utilized.

Order of Words

The words for each letter-cluster are listed in order of apparent decoding difficulty. Generally the words go from the least complex (the cluster and an initial consonant) to the most complex (the cluster and many syllables and blends). This order of difficulty, however, is not based upon established fact. The teacher may find that according to his or her own students the order of difficulty would be somewhat different from that listed. It may be different for varying cultural and regional groups. The students' listening and speaking vocabularies may determine whether or not a word is simpler or more difficult. Thus, the order of difficulty (Simple, Average, Difficult) is only suggested, based upon general experience, and should not be considered definitive.

You will note that in some cluster word groupings a word may be included in both the Simple and the Average Classification. For example, the word slab is in both Simple and Average for the ab cluster. This was done to examine the effect of starting a new classification with something familiar. It may help in establishing a good mental set for the more complex words to come in the Average and Difficult Classifications.

In the same vein, you will notice that in some Average classifications the words are apparently more appropriate to the Simple. For example, the word bad is included in the Average for the ad cluster. The word is apparently more appropriate in the Simple. Here again, we want to see if the inclusion of a less complex word in an Average or Difficult classification leads to anticipation that the remaining words will not be continuously more demanding. To the student having difficulty it may offer a plateau effect--in a sense, a respite.

Number of Words

You will note that the total number of words utilized to condition to each cluster is not the same. Thus, within each cluster there are not the same number in the classifications of Simple, Average, and Difficult. In fact, as stated, some

clusters may not have any words listed under one of the three orders of difficulty classifications. This lack of conformity is predetermined. It is controlled by the incidence of words that included the letter-cluster discovered in our examination of scores of lists that totaled thousands upon thousands of words. The total words listed for each cluster and the number included for its Simple, Average, and Difficult classifications was thus determined by what was globally found in reading material. For example, in the are cluster, the words discovered could only be listed under the Difficult heading. This was true also for the au and the ea clusters. In contrast, for the oo cluster we could not find words that we would list as Difficult. Our lists and our classifications reflect what is more or less common in the English language.

Difficulty Is Redefined

The teacher working with the younger student may feel that the words included in the Average and Difficult classifications are esoteric for the individual or group he or she is working with. However, this apparent difficulty may not be real when teaching GLASS-ANALYSIS. In most instances, the Average and Difficult words are those which are found in middle and upper grade texts. All the words in the program are ones which have to be met and decoded if the youngster is to have normal developmental growth in his ability to decode. It is felt that a frontal decoding attack upon all words in the Kits can lead to an effective and parsimonious breakthrough in decoding. Remember, we are not dealing with the problems of meaning and implication of meaning that is inherent in each word. We leave that to the broader reading program. At this point we primarily want the youngster to develop the ability to letter-cluster correctly.

Of course, if a word is too esoteric for the youngster, it could be passed by. However, our experience with the program has been that if youngsters are "learning" to the extent that they are developmentally moving into the more complex words, they either are at least ready to hear these words spoken, or they already have the words in their listening vocabulary.

The widely held assumption that we must teach youngsters to decode only words which are familiar to them is, in this program, open to serious question. As stated in the rationale for GLASS-ANALYSIS (see monograph), learning to decode is not made dependent upon precise careful understanding of words as is expected in other programs. The words utilized in the GLASS-ANALYSIS program make "sense" from a visual and auditory point of view. Just because the meaning may be elusive does not negate the fact that the word can be utilized to develop meaningful habits to decode words of similar letter sequence structure.

Thus be careful not to shy away unnecessarily from the Difficult classification. In most other programs learning to decode is part of the actual reading program. Such programs correctly make a word "difficult" because the word is one that offers more than the normal abstraction in meaning. However, in GLASS-ANALYSIS we instructionally separate the decoding activity from the reading program thus redefining what is difficult and what is not. The "difficult" in GLASS-ANALYSIS is controlled by one's movement through the sequential material presented in the program. When learning to decode, there is no reason why one should not be asked to attack more complex words to help in steady improvement.

The regular reading program will be concerned with the more complex problem of meanir: difficulty. Allow GLASS-ANALYSIS to deal with decoding difficulty in terms of the complexity of the structure of a word (and not the complexity of the word's meaning). Our experience has been that if this working hypothesis is accepted, the decoding activity is significantly fostered.

Some Words May be Omitted

Not all the words in each classification need to be utilized by the teacher. If, at times, the Simple words become needlessly repetitious in terms of the single consonant and family words, the teacher could pass them by and go on to the more complex words. Some students may respond so well to the program that to include each word (particularly in the Simple) would be meaningless. It is an easy matter for the teacher to pass by any words she feels would not be appropriate for the student or the group.

(However, the expressed purpose of the program is to foster perceptual conditioning for the clusters, not to teach each word as a sight word. Words should be eliminated only when the teacher feels she has given enough training with the letter-cluster, not with the word.)

A Minor Exception

Some words "leak out" of our rationale in that they cluster according to a common consonant cluster rather than a vowel cluster. In words such as beheld and became we discovered that the be is visually and auditorilly so common that it immediately clusters for the reader. In these words and others like them, the be should be used as a cluster rather than that beginning with the vowel. We also discovered that when the "a" is in the initial position such as in away, alone, and about, the "a" does not form a letter cluster but maintains its own sound. Fortunately our experience has been that the "be" and the "a" sounds offer little or no difficulty to the students who are having difficulty in learning to decode. They "condition" to

these early and permanently.

At-Sight Decoding in GLASS-ANALYSIS

"At-Sight Decoding" from a text is a necessary part of the GLASS-ANALYSIS program to teach decoding. The at-sight oral reading gives letter clustering practice in the actual words students will meet when they read independently and allows for practice in developing a wide sight vocabulary.

During the learning-to-decode stage of reading, every effort should be made to plan for each child to do as much at-sight oral reading as is feasible. Teachers and paraprofessionals may want to schedule practice in at-sight oral reading times other than the regular GLASS ANALYSIS scheduled session. Students in the crucial formative stage of learning-how-to-decode can never get too much practice in decoding.

The basal reader or other controlled text used for the at-sight-oral-reading should be one that is somewhat of a decoding challenge to the child. Because the decoding session does not attempt to engage the child in comprehension and various forms of critical reading, the instructor is able to use material of greater difficulty than would be used in the normal reading situation. A text used for oral reading is considered to be too low a level if the youngster can routinely identify 90% or more of the words. Then, in essence, the student is only practicing what he knows and this can be accomplished without the benefit of a teacher's listening-in to help. Easy and enjoyable oral reading activities are most appropriately engaged in during the day when youngsters are encouraged to read interesting stories to each other. This kind of oral reading has many benefits which go beyond the more mundane activity of teaching decoding via GLASS-ANALYSIS.

Examine carefully the book used by the student for at-sight oral reading. In most cases we would predict that he could advance at least one-half year in the basal sequence. Uniquely, in the GLASS-ANALYSIS program, we have found that when we work in more difficult material, we observe more rapid growth than when we stay at a relatively comfortable routine success level. Try to plan to conduct each lesson in a way which consistently challenges the student to strive for higher-level decoding abilities.

Opportunity to Individualize

The exposure of only one word at a time allows for advantages over material presented on a page or when a whole list is exposed to a youngster. In GLASS-ANALYSIS you can individualize for each youngster in a group because there is no apparent omitting for some and adding for others. What will be presented for decoding will routinely be controlled by the teacher. Teacher decisions will be based upon experience with

the student or group. Knowledge of intelligence, experiential background, cultural uniqueness, regional placement, motivation and attitudes, and the infinite other factors that relate and interrelate to each other make each child and each situation the cause for teacher-made decisions.

"Individualizing" of instruction in decoding can be done in groups as well as when the teacher is working with only one student. Individualizing requires that students in the group are always thought of individually with particular instructional needs. Fortunately, in teaching decoding, students' needs are often overlapping and not narrowly specific. All students benefit from looking at whole words and identifying the appropriate visual-auditory cues within the whole word. Because of this and because, in GLASS ANALYSIS, the student and teacher responses are relatively short, there are no long periods of sitting by while someone else is worked with.

The teacher instructing a group always differentiates her teaching according to the student being asked to respond. A weak student is questioned on his own level while a better student is asked to give information on a higher level. Each could benefit from listening-in on the other's response and the teacher's teaching to that response.

Differentiation of teaching in a group situation requires that the teacher minimize questions to the group as a whole. Questions should be directed to a particular member with specific learning needs in mind. A teacher may know that one student is more reticent to respond to questioning and, therefore, may want to motivate by some supportive comment before the actual question is presented. Other students in the group may need to be kept in close contact with the activities of the group simply by frequent questioning that asks the student to repeat what another member of the group just said. Questions to specific members of the group may range from asking for simple parroting of the information given by the teacher to the higher level questioning of the student to identify, on his own, the letter and sound association within a whole word. To the extent that the range of decoding ability could be narrowed within a group, the teaching of each individual student will be applicable to the other members of the group as well.

IT'S REALLY VERY SIMPLE

It should be noted that training for perceptual conditioning is as simple as written. In fact its very simplicity is causing problems. Many teachers, when they do apply the method, tend to add activities, which though acceptable in reading programs, only tend to dilute the effects of working toward perceptual conditioning for decoding. The Glass-Analysis approach does not allow the utilization of pictures nor does it include the children's writing of any letters or words. It does not include a discussion of ideas which might be generated from the sight of a word. (We are teaching decoding, not Reading.) Socialization with the child is kept at a minimum so that as much as possible will be used for learning to decode. Reading activities should not interfere nor dilute meaningful repetition of letters and sounds. Our approach may represent an abominable way to teach Reading, but we feel it to be effective in teaching decoding.

Reports from our teachers state that Glass-Analysis may teach children decoding but it is vulnerable to boredom for the teacher. It is unfortunate that this is so. But our experiences have been that when we add material to make it more interesting both for the teacher and the youngster, we cause conditioning leakage and thus, for some children, slow down the acquisition of decoding skill. For some children, particularly the youngsters with learning disabilities, this lessening of the perceptual conditioning effect may be crucial.

The only materials needed are the carefully selected words (containing common letter clusters), preferably printed on flash cards, and any basal that is at the decoder's decoding level. Again, we are merely teaching decoding and not the more complex dimensions of Reading. The reading program should continue at any time after the training session in decoding is completed.

DECODING ABILITY SCREENING TEST

Words may be printed on separate cards or in list form at least three spaces apart. A response is correct if the letters in the word could sound the way the examinee made the response. For example, in the word tonometer the response could be any one of the following: tun-o-meter, tun-om-et-er, to-nom-eter.

<u>Esoteric</u>		<u>Possible</u>	
1. intervent	8. stimulus	16. fentovite	23. hanfenbine
2. carpolite	9. titration	17. nugsinbace	24. mestanglock
3. tonometer	10. explicate	18. bexnayhope	25. beshdegnuck
4. introvert	11. isotherm	19. hurpolding	26. opdangunair
5. blastment	12. astrolabe	20. lishbarness	27. edstolyack
6. ligulate	13. ephet	21. eckpidseep	28. tuspurstim
7. polarize	14. retrograde	22. adzooler	29. torpelnin
15. dissonant		30. hawlatwight	

RECOMMENDED NORMS

<u>Percent Correct</u>	<u>Indications</u>
80 - 100%	No more instruction necessary in decoding.
50 - 79%	Minimum instruction in decoding needed. Do a great deal of oral at-sight reading.
25 - 49%	Normal grade level instruction in decoding.
0 - 24%	Needs careful remedial work if the student is in grade 3 or above. If below grade 3, a score in this range makes the test not applicable.

TEACHING DECODING: Glass-Analysis for Perceptual Conditioning

Method

Expose one card to the student. Keep student as close to you as practical. Make sure the student can see the card and is always looking towards the card. The whole card is always presented. Parts of a word are never covered up for identification.

Questioning Technique

A. Using the word "song"

This word says "song".

What does the word say?

In the word "song", what letter makes the "s" sound?

what letters make the "ong" sound?

what letters make the "song" sound?

In the word "song", what sound does the letter "s" make?

what sound do the letters o/n/g make?

what sound do the letters s/o/n/g make?

What does the word say?

B. Using the word "stronger"

This word says "stronger".

What does the word say?

In the word stronger, what letters make the "str" sound?

what letters make the "ong" sound?

what letters make the "strong" sound?

what letters make the "er" sound?

In the word stronger, what sound do the letters s/t/r make?

what sound do the letters o/n/g make?

what sound do the letters s/t/r/o/n/g make?

what sound do the letters e/r make?

what sound do the letters o/n/g make?

what sound do the letters s/t/r/o/n/g/e/r make?

What does the word say?

Above Grade 2:

1. If I take off the "strong" sound, what sound is left?

2. If I take off the "er" sound, what would be left?

(If I prefer to work only with word parts, unless there is a specific reason - such as learning blends).

The type of questioning done in relationship to each word card is determined by the rationale of the Glass-Analysis method. You will recall the purpose is not to teach the identification of the word. The word is merely utilized to help the learner form perceptual conditioning habits for a specific vowel cluster in a word and for other structural parts of the word. Thus, the lesson is not considered complete or successful if the student can identify the word at sight. The lesson must include those activities designed to help toward forming auditory and visual responses to the appropriate structures within the word.

When working with an individual or a group of four or less, fifteen or twenty minutes instructional sessions have proven to be appropriate. This would include approximately two-thirds of the time working with the word cards and the structured questioning, and one-third of the time working in sentences and/or basal at sight reading.

Students who have a history of difficulty in learning to decode would significantly benefit from two 15-20 minute sessions daily, preferably at least two hours apart.

AT SIGHT READING

Every effort should be made to include "at sight" reading from the basal in each instructional session. The basal should be at the level in which the student can identify, at sight, at least eight out of ten running words.

The oral reading should not be halted for purposes other than those which directly relate to decoding. Thus, there should be no attempt to aid in diction skills, vocabulary knowledge, comprehension skills, or any of the activities that should bonafidely be within nondecoding activities. If the words are being decoded correctly merely listen and make a minimum of overt reinforcing responses.

If the word is not known or not correctly identified the teacher must instantly decide whether or not the word is a "Nix" word - a word that would best be identified as a sight word. If it is a "Nix" word, i.e., Mary, pretty, what, merely voice the word and ask the student to repeat it.

If the word contains a common letter cluster, advise the student as to what letters to attend to and what sound these letters represent. For example, "look at the a/n in that word. The a/n says, 'an'. What does the whole word say?" If the student does not say "canal", give the whole word.

EVALUATION OF CLUSTER CONDITIONING

The technique will be most profitable to the student if he can use it in decoding words while reading from the printed text. Therefore observations of the student's oral reading and discussion of how he is decoding words during silent (or oral) reading are the optimum evaluation procedures. In order for the student to receive maximum benefit from the program he must be able to independently cluster letters to decode the word.

The instructor can also observe the student's responses during the questioning period and through the use of a number of reinforcement activities.

EASIER KIT WORD LIST

Glass-Analysis for Perceptual Conditioning

CLUSTER	SIMPLE			AVERAGE	DIFFICULT	
1. (t)ab	tab cab jab dab slab	crab drab stab grab scab		slab cabin fabric establish abnormal	abdicate prefabricate rabid babble abstract	absolute basorbing abstain abdominal abbey abduct
2. (b)ack	pack back sack tack Jack lack rack	track stack slack crack clack shack		smack snack whack package	jackets backbone blackbird mackerel	slackens blackout crackers mackintosh
3. (h)ad	sad mad pad lad	tad had clad glad	sad bad sadness madder Daddy	radish padlock admit	address advance administer admire saddles	graduate disadvantage advertise advantage admiration
4. (t)ag	bag tag sag nag lag	hag rags drags brag flag	sagging stagger fragment magnet magnetic magpie		magnify magnetize maggot vagabond antagonist magnanimous	
5. (h)am	Pam ram jam ham slam	cram clam pram gram swam	ham Sam dram camper	lamp amber stamping scamper bamboo	family ample sample gamble ambush amplify	Amsterdam examination ambition ambulance amnesty
6. (p)an	fan man ban can Dan Nan pan	tan van plan clan span scan than	planning canteen antic anthem	canvas Canada branches ancestor		

STER	SIMPLE		AVERAGE	DIFFICULT
7. (s)and	band land sand hand bland	brand stand grand	Andy sandbox random candle expand commanding standard	landscape bandage candidate sandwich biandishment
8. (m)ap	map tap cap gap nap rap lap slap	flap clap trap chap strap	happen happy flapping apple	napkins clapped trapping happening capitol wrapped Japanese apprehend apricot appendix apparatus aptitude apathetic
9. (c)ash	dash rash cash hash slash	crash splashing flashy smashing ashes	ashtray bashful flasher Ashland stashing flashlight	cashew dashboard unabashed cashier
10. (s)at	sat bat fat mat rat cat hat	pat flat chat scat that sprat	matter clatter chatter matching that	thatch scatter Atlantic rattles scratching
11. (s)ay	may pay lay jay day gay ray way	bay hay tray stay pray gray stray spray	say clay play players mayor	crayon daytime delaying displaying
12. (w)et	met bet get let set pet	net jet wet yet	get letter forget kettle	upset etch secret closetful settlements

EASIER KIT WORD LIST

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CLUSTER	SIMPLE		AVERAGE		DIFFICULT	
11. (h)im	Tim		slim		slim	
	Jim		trim		swimming	
	dim		brim		trims	
	him		swim		timid	
	rim		limit		impress	
	Kim		prim		important	
	vim				immortal	
					whimsical	
14. (p)in	tin	kin	win	inch		
	pin	spin	spin	windows		
	bin	grin	inside	intended		
	fin	shin	winner	cabinet		
	win	chin	dinners	splintering		
		skin				
15. (s)ing	ring		cling		things	
	sing		sling		swing	
	king		string		finger	
	wing		spring		willing	
	bring		bring		stinger	
	sting		thing		strings	
	fling				swingers	
					twinkling	
16. (d)ish			dish	finish	banish	banishment
			wish	punish	folishly	accomplishing
			fishing	fisherman	publish	establishment
			swish	Spanish	lavish	vanquish
			dishes		abolish	
					outlandish	
17. (p)it	sit		sitting		kitchen	
	hit		slitting		pitcher	
	kit		city		rabbits	
	pits		itch		visitors	
	slit		switch		littlest	
	skit		armpit		bitterly	
					Italy	
					quit	
18. (t)old	sold	gold	colder		mold	behold
	told	hold	holding		golden	beholden
	bold	mold	holder		boldness	freehold
	fold	scold	goldfish		unfolded	foretold
	cold		olden		scolded	
			molding			

CLUSTER	SIMPLE		AVERAGE		DIFFICULT	
19. (t)op	top mop pop hop drop	shop flop stop crop chop prop	chopper chopping shopper optic copy shopkeeper popcorn		stopped operate optical myopic optimist operatic optional	
20. (p)ot	not pot rot dot cot got	hot jot lot tot shot trot	blot blotter blotted trotting cotton	rotten potted otter lottery pottery		
21.. (s)um			sum gum hum jump stump	pumper bumping plums clumsy	humming mumbling pumpkins grumpy	humble album thumbs umpire
22. (s)un	sun fun bun gun run pun stun spun shun funny		bunch munch trunk sunken until punting running understand		sunshine blundering punishment thundering hundred jungle bungalow uncomfortable fundamental	

MEDIUM KIT WORD LIST

Glass-Analysis for Perceptual-Conditioning

CLUSTER	SIMPLE	AVERAGE		DIFFICULT
1. (f)ace		race pace face space grace	place spaceman misplace retrace graceful	aces deface faceless disgraceful replacement traceable
2. (m)ade		made wade grade shade blade	trade glade parade arcade lemonade	
3. (t)ake	bake take make wake rake brake lake stake fake shake cake drake sake snake			bakery awake stakes mistake brakeman cornflakes snowflakes wakefulness
4. (s)ame		same name lame game fame	blame flame frame became blameless	
5. (s)ang		sang rang sprang banging mango		jangling strangle angrily manganese
6. (t)ank		bank sank tank banking Frank	banker blanks cranking blanket	
7. (c)ape		cape shape drape scrape apes shapely escape		

USTER	SIMPLE		AVERAGE		DIFFICULT	
8. (t)ar	far	star			harbor	argue
	tar	dart			armor	regardless
	bar	harp			army	partnership
	car	scar			marketing	registrar
	jar	start			harvesting	marvelous
9. (m)ate	ate	state	stately		dedicate	
	late	crate	gateway		celebrate	
	gate	plate	grateful		abdicate	
	hate	slate	imitate		animate	
	fate	skate	separate		arbitrate	
			decorate		communicate	
			investigate			
10. (b)ed	bed	red	fled		wedding	admittedly
	led	sled	Fred		edge	sedative
	Ted	sped	bled		pedaling	editorial
	Ned	fled	bedding		comedy	meditate
	wed	shed	parted		repeatedly	
			wicked			
			assorted			
11. (h)em			hem	lemmon		
			gem	temper		
			stem	membership		
			them	themselves		
			empty			
12. (t)en	men	pen	ten	penny	dentist	avenger
	ten	glen	bench	happen	attending	amendment
	den	then	slender	energy	entrance	valentine
	hen		trench	entrance	enjoyment	encampment
	Ben			seventeen	slackening	
13. tent	bent	tent			went	decently
	rent	cent			spent	sentence
	sent	went			present	armament
	lent	spent			convent	amazement
	dent	plenty			apartment	enterprise

CLUSTER	SIMPLE		AVERAGE		DIFFICULT
14. (b)est	best rest test nest	vest pest west	testing restful rested biggest resting	hardest arresting forests yesterday	interest harvester westerly festive investigate estimate destination ancestor quest bequest
15. (h)id			did kid lids slid kidding	window hidden skidded tidbit	rapidly middle rancid kidney candidly
16. (r)ide			hide ride wide slide widely	divide beside inside confide subside	
(b)ig			dig big jig pig figs	wigs twig digging trigger biggest	wiggle ignite shindig ignorant dignity
18. (d)ip	dip lip nip rip ship	chip zip trip whip strip			figment stigma zigzag ignorance astigmatism
19. (l)ock	dock lock mock rock	sock clock block	stock stockings smock crook frock	shock rocking lookers locket hockey cockpit knocker burdock	
20. (s)ong			long longest along songster	stronger belonging wrong prolong	

MEDIUM KIT WORD LIST

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CLUSTER	SIMPLE		AVERAGE	DIFFICULT	
21. (s)uck			duck buck struck trucking lucky	pucker buckets buckle duckling woodchuck	
22. (m)ud	mud bud dud	cud stud thud			
23. (h)ug	bug tug rug dug hug jug drug plug smug snug chug shrug		ugly buggy tugging snuggle drugstore shrugging plugging ugliest bugaboo		
24. (c)up			pup cup upset setup uplift	supper uphold suppose uproot buttercup	cupful cupcakes upright ketchup upstairs
25. (r)ut	nut but cut hut rut strut shut		cut butter button shutter utmost mutton	crutch strutted fluttering nuthatch	syrup supporting corrupted abruptly supplement

HARDER KIT WORD LIST

I

Glass-Analysis for Perceptual Conditioning

CLUSTER	SIMPLE	AVERAGE	DIFFICULT
1. page		page cage sage ageless enrage	outrage engagement sagebrush cageling outrageous
2. pale		sale male tale pale	whale scale resale saleable
3. walk		talk walk walking chalk	talker talkative
4. cane		sane cane pane mane vane	wane crane insane airplane
5. glas(s)		gas passing asking flasks grassy ascot aspen brassy classic	cascade asbestos classify exasperate asphalt aspiration classification
6. past		fast past last vast nasty fastest blasting plaster master aster	vastly masterful drastic repast castaway fantastic castenets asterisk asterism asteriod
7. save		save gave cave rave wave slave grave brave pavement slavery	
8. team			beam dreaming scream creamer creamy steamship screaming streamline steampipe
9. seat		eating eaten seated wheat neatness meatballs repeat cheating defeat treaty	

CLUSTER	SIMPLE		AVERAGE		DIFFICULT	
10. yes			yes dressing dresser messy unless	lesson princess express Eskimo	regress essay essence depressor	countess distressing expressive possessive
11. ev			ever never clever cleverly every	devil several Everest everything	evident revolution evolution reverent disheveled inevitable	
12. tic, ic			panic optic topic tropic tropics tragic	attic Arctic Antarctic optical tropical epic	picnic traffic terrific frantic picture	strictly predictable applicable articulation antiseptic
13. il, ill	ill bill fill hill mill pill sill will drill	chill frill grill spill still skill quill shrill thrill	ill pills until guilt silver	illness silly pencil billboard		
14. ind (find)			find bind remind kindest		kindly kindness reminder unwinding mindlessness	
15. bite			bite kite white write		invite spiteful quite ignite	
16. joke			coke joke spoke smoke choke		broke stroke invoke provoke	
17. roll			roll roller stroll	stroller toll colts molting		

CLUSTER	SIMPLE			AVERAGE	DIFFICULT	
18. folly					dollar collars hollow follow following	trolley politics tolerant abolish solitude
19. com					compass commander combatant from accomplish competent omnibus thermometer chronometer	
20. bone				tone bone bones	drone phone	lonely bonehead silicone hormone telephone
21. tore				bore store before explore score	foresee ashore ignore forerunner foretell	
22. toss				toss moss tossing losses	bossy across crossly crossing	
23. most				most mostly posting posted	postcard almost hostest	
24. rove				rove dove cove wave clove	stove drove grove alcove	
25. how				now how owl	gowns clown clowning	flowers towels crowded drowning township
26. know	low mow row tow	show slow blow flow	crow grow stow snow	low grow blown below owners	showing slower throwing following shadows Halloween	
27. bus				bus plus tusk	rust rusting trust	trusted August dusty crusty lustful discuss

STUDENT'S RECORD SHEET FOR WORD-ANALYSIS

Student's Name _____

School and Grade _____

Cluster	Set I	Set II	Set III	Cluster	Set I	Set II	Set III
1. ab				1. ace			
2. ack				2. ade			
3. ad				3. ake			
4. ag				4. ame			
5. am				5. ang			
6. an				6. ank			
7. and				7. ape			
8. ap				8. ar			
9. ash				9. ate			
10. at				10. ed			
11. ay				11. em			
12. et				12. en			
13. im				13. ent			
14. in				14. est			
15. ing				15. id			
16. ish				16. ide			
17. it				17. ig			
18. old				18. ip			
19. op				19. ock			
20. ot				20. ong			
21. um				21. uck			
22. un				22. ud			
23.				23. ug			
24.				24. up			
25.				25. ut			

KEY: X Attempted

O All elements known

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STUDENT'S RECORD SHEET FOR WORD ANALYSIS

Student's Name _____

Grade and School _____

1. age		1. ai		1. ou	
2. ale		2. au /o/		2. our /or/	
3. alk		3. aw /o/		3. ou /oo/	
4. all		4. c /k/		4. ou /oo/	
5. ane		5. c /s/		5. ou /o/	
6. as(s)		6. c /k/s/		6. ou /o/	
7. ast		7. ch		7. ou /u/	
8. ave		8. ch /k/		8. ough /o/	
9. eam		9. ch /sh/		9. ough /uff/	
10. eat		10. dg,dze /i/		10. oi	
11. es		11. ea /e/		11. cy	
12. ev		12. ea /a/		12. ph /f/	
13. ic		13. ear		13. per	
14. il		14. ear /air/		14. pre	
15. (r)int		15. ear /er/		15. qu	
16. ite		16. ear /ar/		16. ci /sh/	
17. oke		17. ei /a/		17. si /sh/	
18. (r)oll		18. ei /e/		18. ti /sh/	
19. (d)oll		19. ie /e/		19. ture	
20. om		20. ew /oo/		20. dure	
21. one /on/		21. f		21. /er/	
22. ore		22. f /i/		22. ar	
23. oss		23. g /a/		23. or	
24. ost		24. h /h/		24. ed /ed,id/	
25. ove		25. ire		25. ed /d/	
26. ow		26. ish	254	26. ed /t/	
27. ow /o/		27. ism		27. Vowel Y	

- Level A. Given a series of claps, ranging from one to four, reproduce the clapping pattern.
- Level B. Given a spoken phrase of numerals, "write" the phrase, using a horizontal dash (drawn from left to right) to represent each numeral, and "read" aloud any dash on request.
- Level C. Given a series of spoken words followed by the same series from which one word has been omitted, state the omitted word. (For example, "Say I see you." "Now say I see." "Which word did we forget to say that time?")
- Level D. Given a spoken two-syllable compound word, restate the word omitting a designated syllable. ("Say cowboy." Now say it again, but don't say boy.)
- Level E. Given a spoken three-syllable word, restate the word omitting a designated syllable. ("Say carpenter." Now say it again, but don't say car.)
- Level F. Given a spoken word, repeat the word omitting its initial consonant sound. ("Say bat."; "Now say it again, but don't say /b/.")
- Level G. Given a spoken word, substitute one beginning or ending sound for another. ("Say meat."; "Now say it again, but instead of /t/, say /n/."; or "Instead of /m/. say /f/.")
- Level H. Given a spoken word containing a consonant blend, substitute one consonant sound for another. ("Say slip."; "Now say it again, but instead of /s/, say /f/."; or "Instead of /l/, say /k/.")
- Level I. Given a spoken word containing a consonant blend, omit one consonant to make a new word. ("Say stay." "Say it again but leave out /t/.")
- Level J. Given a spoken word containing a consonant blend, omit one consonant of the blend to form a nonsense syllable. ("Say fling." "Say it again but leave out /l/.")

From "Auditory Analysis Training with Prereaders," Jerome Rosner, The Reading Teacher, Vol. 27, No. 4, January, 1974, pp. 379-384.

AUDITORY ANALYSIS TRAINING

The term auditory analysis refers to the resolution of spoken words into their phonemic elements. The goal of auditory analysis training is to teach the child a process for identifying the acoustical elements of the reading-spelling code as heard in the context of spoken language.

The training program is organized into eight levels. Listed on the cards that follow are the terminal objectives for the eight levels and stimulus words and patterns to be used with the children.

AUDITORY ANALYSIS TRAINING

From:

Jerome Rosner, "Auditory Analysis Training with Prereaders," The Reading Teacher, Vol 27, No. 4, January, 1974, pp. 379-84.

Terminal objectives for eight levels of auditory analysis follow:

Level A. Given a series of claps ranging from one to four, reproduce the clapping pattern.

/	/ ///
//	// //
///	/ /// /
////	/// /
/ //	
// /	

Level B. Given a spoken phrase of numerals, "write" the phrase, using a horizontal dash (drawn from left to right) to represent each numeral, and "read" aloud any dash on request.

(Say, "Four, two, six," while child writes horizontal dashes from left to right. Ask child, "What is this numeral?" as you point to one of the dashes.)

426	4539	You may have to begin with two numerals for some children.
562	7623	
374	4752	
825	2463	

Level C. Given a series of spoken words followed by the same series from which one word has been omitted, state the omitted word.
(For example, "Say 'I see you.'" "Now say, 'I see.'" "Which word did we forget to say that time?"

I see you.
Please come here.
Turn him around.

Where did you go?
Come play with me.
Please come here.

(Difficult)
You may go shopping.
Come play with me.
This is his money.

Level D. Given a spoken two-syllable compound word, restate the word omitting a designated syllable.
("Say cowboy." "Now say it again, but don't say boy.")

cowboy	rainbow	earthquake
houseboat	touchdown	airport
ballgame	homesick	yearbook

Level E. Given a spoken three-syllable word, restate the word omitting a designated syllable. ("Say carpenter." "Now say it again, but don't say car.")

<u>car</u> pen <u>ter</u>	furnit <u>ure</u>	summ <u>er</u> time
trampol <u>ine</u>	super <u>man</u>	super <u>man</u>
snowmob <u>ile</u>	handl <u>ebars</u>	coffe <u>epot</u>
calen <u>dar</u>	coffe <u>epot</u>	battl <u>eground</u>

Level F. Given a spoken word, repeat the word omitting its initial consonant sound. ("Say bat." "Now say it again, but don't say /b/.")

<u>f</u> in	<u>c</u> ar	<u>p</u> in	<u>t</u> all	<u>s</u> at
<u>f</u> ar	<u>p</u> ill	<u>r</u> an	<u>f</u> or	<u>t</u> ape
<u>p</u> ace	<u>l</u> and	<u>s</u> ink	<u>f</u> air	<u>f</u> ee <u>t</u>
<u>r</u> ink	<u>r</u> ace	<u>m</u> an	<u>h</u> am	<u>d</u> oor

Level G. Given a spoken word, substitute one beginning or ending sound for another. ("Say meat." "Now say it again, but instead of /m/, say /n/.")

meat	neat	("Say meat." "Now say it again, but instead of /t/, say /n/.")	
soap	hope	meat	mean
coat	boat	leg	led
king	sing	rat	rag
bent	dent	rope	rode
sing	ring	rug	rug
hope	rope	pin	pit

Level III. Given a spoken word containing a consonant blend, substitute one consonant sound for another.
 (Say slip." "Now say it again, but instead of /s/, say /f/.") Or, ("Say slip." "Now say it again, but instead of /l/, say /k/.")

<u>slip</u> - flip	<u>slip</u> - skip
<u>flap</u> - clap	<u>play</u> - pray
<u>brag</u> - drag	<u>spin</u> - skin
<u>flap</u> - slop	<u>stick</u> - slick
<u>brong</u> - crown	<u>clown</u> - crown
<u>brown</u> - frown	<u>swim</u> - slim

Level I. Given a spoken word containing a consonant blend, omit one consonant to make a new word.
 ("Say stay." "Say it again but leave out /t/.")

<u>stay</u> - say	<u>stop</u> - top
<u>skip</u> - sip	<u>slide</u> - lied
<u>sting</u> - sing	<u>probe</u> - robe
<u>slick</u> - cick	<u>pray</u> - ray
<u>trip</u> - tip	<u>drag</u> - rag
<u>try</u> - tie	<u>track</u> - rack

Level I. Given a spoken word containing a consonant blend, omit one consonant of the blend to form a nonsense syllable.
 ("Say fling." "Say it again but leave out /l/.")

<u>fling</u> - fing	<u>fling</u> - ling	<u>desk</u> - dek
<u>drink</u> - dink	<u>drink</u> - rink	<u>past</u> - pat
<u>sleep</u> - seep	<u>sleep</u> - leep	<u>blast</u> - blat
<u>spud</u> - sud	<u>spud</u> - pud	<u>blast</u> - blas
<u>step</u> - sep	<u>step</u> - tep	<u>burst</u> - hurt

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Variables which affect the complexity of accoustical patterns are:

1. The size of the unit of analysis (word, syllable, phoneme).
2. The complexity of the context in which the sound is embedded (part of a consonant blend versus a single consonant followed by a vowel)
3. The relative position of the sound within the word (beginning, final, medial).

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IN-SERVICE MEETING
PERCEPTUAL TRAINING WORKSHOP
READING, MATHEMATICS TEACHERS

Wednesday, December 6, 1978
Two Allegheny Center
Conference Center
12:30 - 3:30

Evaluation

- OBJECTIVES:
1. To give teachers hands-on experiences in matching instruction to students' modality.
 2. To give teachers hands-on experiences with materials that can be used to remediate perceptual deficits.

EVALUATION: 1. Which objectives were met? Not met?

2. What experiences can you apply in your instructional program?
3. What else do we need to work on in the area of perception?
4. Negative comments should be made here. What could have been done better? Give suggestions for improvement.
5. Indicate your needs for future in-service programs.

WORKSHOP IV

IN-SERVICE MEETING
READING OR ARITHMETIC?
WRITING THE PERCEPTION IIP
READING, MATHEMATICS TEACHERS

Monday, January 22, 1979
Two Allegheny Center
Resources Center
12:30 - 3:30

Agenda

12:30 - 12:40	Overview of Workshop Activities
12:40 - 1:30	Trouble with Word Problems: Reading, Arithmetic, or Perception? Discussion - Lucille Naughton
1:30 - 2:30	Ways to remediate arithmetic reading problems - Lucille Naughton
2:30 - 3:15	Writing perceptual training into the IIP - Corinne Piatt
3:15 - 3:30	Wrap-up and Evaluation

'RITHMETIC READING--IN THE CENTER SPOT

by Jack Cassidy and Verna Sharkey

It takes special skills to "read" math. Zero in on math symbols, vocabulary and comprehension with an activity/game center.

(In this "spot" Teacher helps teachers share ideas for classroom learning centers, or stations. All centers included are based on the idea that, given carefully planned materials and instructions, children are capable of directing their own learning at their own pace.

Teaching reading in the content areas has become an increasing concern of classroom and special area teachers. This month's reading/math center suggests a direction to take for helping kids with math reading.

If you are interested in sharing your most successful centers with other teachers, you may want to request a "Center Spot" writer's guide from Teacher, "The Center Spot," One Fawcett Pl., Greenwich, CT 06830.

Statements like "He has trouble with reading, but I'm sure he'll be all right in math" are common. But it is becoming increasingly clear that this kind of assumption is very often false. The ability to read can and does dramatically influence a child's success in mathematics, particularly in the area of word problems.

To provide children with some help in "reading and 'rithmetic" as part of our Project C.A.R.E. (Content Area Reading Enrichment), we isolated reading skills particular to math and developed specific activities to reinforce them. We identified five possible problem areas: word/symbol recognition, vocabulary, comprehension, problem-solving and survival. The activities and games described in this article are designed so that youngsters can use them independently in stations. The games might best be introduced by an adult or older student.

The following activities are representative examples for each of the five areas of need. Teachers in grades three through eight have used them in both remedial and developmental situations, and their modifications and suggestions have been incorporated.

1. WORD/SYMBOL RECOGNITION

Mathematics includes many symbols that may be completely unfamiliar to students. "Math Syrbol Bingo" is a good, fun way for kids to become familiar with any group of symbols you are trying to teach or reinforce.

Cassidy, Jack and Sharkey, Verna, "'Rithmetic Reading", Teacher, January 1977.

Math Symbol Bingo

Materials: Tagboard or cardboard, paper clips and a decorated coffee can

$\cap$	$>$	$\leq$
$\emptyset$	FREE	$\div$
$\times$	$\neq$	$=$

How to Make: Cut out six 9" x 9" bingo cards from sturdy cardboard or tagboard. Rule off a grid of nine 3" x 3" squares on each card. Put one symbol in each outside square and write "free" in the middle one. Be sure that the symbols are arranged differently on each of the six cards. Cut out separate cards and write the meanings of each of the symbols on them. Laminate the bingo and individual word cards for sturdiness. You might include more squares on the bingo cards for older children.

A sample bingo card showing intersection, greater than, less than or equal to, empty set, divided by, multiplied by, not equal to, and equals is shown above.

Directions: "Two to six can play at a time. Each player takes one bingo card. The player who goes first draws a card from the coffee can and says, 'Cover the symbol for (whatever word is drawn).' Every player who has the symbol for the word called on his or her bingo card covers it with a paper clip. Players take turns drawing and calling out words. All words drawn should be kept in a separate pile until the end of the game. The first player to cover three symbols in a row, vertically, horizontally or diagonally - calls out 'bingo' and is the winner. Use the pile of cards drawn to verify the winning row. When the game is over, put all parts of the game back in the can."

Shazam! Here is another simple game to reinforce math symbols, words and phrases.

Materials: Cardboard and a coffee can

How to Make: Cover the can and label it "Shazam!" Cut out small cardboard cards and label each with a math word, symbol or phrase. For every six cards make a "Shazam!" card. You can use only one category or

mix them. We include about 45 cards. (There are a number of sources of math word and symbol lists. The booklet "Teaching Reading and Mathematics," published by the International Reading Association, Newark, Delaware, and "Helping Students Read Mathematics", American Book Co. are two good ones.)

Directions: "Three to six can play at a time. Sit in a circle. Take turns shaking the can and pulling out a card. Read the symbol or phrase aloud to the group and keep the card. If you cannot read it, put it back into the can. If you select a 'Shazam!' card, you must return all your cards to the can. The first player to get seven cards wins."

2. VOCABULARY

Children face several obstacles when they attempt to understand mathematics vocabulary. Many math words, such as addend, quadrilateral and polygon are likely to be encountered only in math textbooks. Some words, such as factor, set, table, base, ray, place, and function, are met frequently in a child's world, but their meanings are quite different than when encountered in a mathematics context. A carefully constructed game like "Math Match" provides students with the opportunity to reinforce their knowledge of math vocabulary.

Math Match

Materials: Cardboard

How to Make: Make a game board like the one shown below. Write out one math term on each cardboard card. These should be the same size as the boxes on the game board. Then write the abbreviation, definition or symbol for each of the terms on more cards.

Directions: "Two to six can play at a time. Shuffle the cards and place one facedown on each box on the game board. Place the remaining cards face-down on the box marked "cards". The first player turns over any card on the board. The next player turns over another card on the board. (Cards remain turned over during the game.) If it is a match, he or she pronounces the math word or phrase, places the matched cards face-down on the discard, or "used cards", pile and adds the total number of points shown under the two cards on his or her running score. The same player then covers the spaces left by that match with two cards from the 'cards' pile and another player's turn begins. The player with the most points when all the cards are matched wins. A variation for older students is to play the game like 'Concentration', putting the cards face-down after each turn, so that memorizing their positions becomes part of the game."

	MATH MATCH	
10	5	2
2	CARDS USED CARDS	9
8		4
4		8
7		5
3		6
5		10
1		3
2		7
9		8
3		1
7		4
	6	

3. COMPREHENSION

Comprehension of mathematical prose is particularly difficult for students for a number of reasons. Passages in math textbooks are usually brief explanations or sets of directions without the repetition in many other kinds of narrative. Another challenge is understanding math "sentences" composed of numerals and other mathematical symbols. The exercise below can be an interesting part of a game center and will give students practice in understanding and constructing their own math "sentences" using numerals and other math symbols.

Roll-a-Sentence

Materials: Squares of sponge, plastic foam or foam rubber or wooden blocks, purple, black, green and orange felt-tip markers

How to Make: Prepare eight dice from one of the above materials. Use the purple marker to mark two dice with the numerals 1, 2, 3, 4, 5, 6 and two with the numerals 4, 5, 6, 7, 8, 9. Use a black pen to mark one die with +, +, -, -, x, ÷, and one with +, -, +, +, X, X. With an orange

pen mark one die with the symbols $>$, $>$, $>$, $<$, $<$, $<$. Use green to mark one with the symbols $-$, $\neq$, $>$, $<$, $\leq$, $\geq$. Note: In order to determine which are the symbols for greater than and less than, mark the dice with a dot in the lower right-hand corner.

Directions: "Two to six can play at a time. Players take turns rolling five dice to make a number sentence: for example, $2 + 4 = 6$. Three purple and one black die must be included each time. The Fifth one may be either the green or orange die. Players get five points for each correct "sentence" made with the orange die and 10 points for each one with the green die. The highest scorer after a given number of rounds wins.

4. PROBLEM SOLVING

One of the most difficult aspects of mathematics for most students to learn, and for most teachers to teach, is word problems. Many children have trouble simply figuring out what the problem in that maze of words is. Various types of exercises helping students through that "maze" can result in marked improvement. The activities can be organized in a series of folders, either laminated or covered with clear adhesive-backed paper on which the student can write and erase. Some folders can be made from old workbooks or math textbooks. Following are some examples of activities that might be part of independent folder activities at a problem-solving center. Include answer cards for self-checking.

Without Questions Folders

Directions: "These are not problems; they are simply statements about something that happened. Write a question after each statement that will turn it into a math problem. Check your answer against the answer card; then erase it."

1. Tickets for the fun fair cost 10¢ each; 127 children bought tickets.
2. Sue's team scored 15 runs, and Bill's team scored 14.
3. Kim sold cards at \$2.25 a box. She collected \$20.25.

Extraneous Information Folders

Directions: "Most problems include words and numbers that are not needed to solve the problem. Use a felt-tip pen to mark over all the words or numbers that are not necessary to solve the problem. Do not solve the problem. Check your marks against the answer card and then erase them.

1. There were 26 students who took a spelling test. Bill spelled 42 words out of 50 correctly. Mary spelled 47 words correctly. How many more correct words did Mary have than Bill?

2. George worked two hours mowing a lawn that was 125 feet by 75 feet. He was paid \$1.25 an hour. How much did he earn?
3. The girl scouts ordered 300 boxes of cookies to sell to their 185 customers. Ann sold 50 boxes. If the scouts sell all the cookies, how many boxes will the rest of the girls have to sell?"

Without Words Folders

Directions: "Here are some sentences-math number and symbol sentences! Supply words that make the math sentences into word problems. Remember to write the question. Here is a sample: $1/2 \times 36 = n$. Jean had 36 records. She gave $1/2$ of them to the boys' club and $1/2$ of them to the girls' club. How many records did each club get?"

"Now make problems for: $6 + 7 = n$. $42 \div 7 = n$. and $20 + n = 31$."

5. SURVIVAL

Introducing functional literacy skills in all grades even at the elementary level is an increasingly important need and goal in schools throughout the country. Every curriculum area should stress some survival skills necessary in today's world. A fourth grader, for example, should be able to read advertisements in the newspaper and simple recipes. A child should also be able to compute accurately the amount of money needed to purchase given items and the amount of ingredients needed to make a dish for a given number of people.

Though survival, or functional, reading materials are often not inherently interesting, teachers can use them to create stimulating activities. One idea that has been particularly successful for us is our "Make a Folder" station. We have found that students learn as much from writing questions as they do from answering them. The technique works for other curriculum areas, too. Some prior teaching will be needed to acquaint the students with different kinds of questions.

Make-a-Folder

Materials: A sample finished folder, blank folders and functional reading materials, such as recipes, newspaper ads, applications and sets of directions.

How to make: Create a sample folder containing a piece of functional reading on the left-hand page and vocabulary, comprehension and follow-up questions on the right. One of our folders features a floor covering ad, including types, prices and advantages of different kinds. A vocabulary question asks students to match a list of symbols and words with a list of words for the symbols and synonyms (for example, 12" and 12 inches; imperfection and fault). Comprehension questions include: "Which floor covering would be good for apartment living and why?" and "If your room was 11' x 11' and you purchased Fairalon, would you waste 11 sq. ft., none, 22 sq. ft, or 12 sq. ft?" One follow-up question is: Find another ad for floor covering. How would you compare the products it describes with those in this one?"

Directions: "Look at the sample folder. Take a blank folder, choose one of the reading examples and make your own modeled on the sample. Include: four vocabulary questions that focus on key words needed to understand the material; four comprehension questions, making sure some include computation; three follow-up activities that require going beyond the material you choose."

(Jack Cassidy is supervisor of reading and coordinator of the gifted education program for the Newark, Del., public schools. Verna Sharkey is elementary math coordinator for the same district and instructor of elementary math of the University of Delaware. The activities in this article and other math/reading activities have been collected into a booklet that is available for \$1.00 from : Staff Development and Resource Center, Newark School District, 193 West Park Drive, Newark, DE 19711.)

Arithmetic Skills

1. Build arithmetic skills in sequential steps in a structure which will demonstrate the relationships of the process. Work problems on graph paper, notebook paper with the vertical lines or rule off sections of the paper so that the individual does not lose track of the operations.
2. It is often necessary to give support in recognizing and comprehending the order of numbers, determining relationships, what to look for in relating a sequence of numbers.
3. Develop relationship concepts from the concrete to the abstract as enumerated in the main body of the report.
4. Allow the individual to use charts and concrete aids in the classroom.
5. Highlight the operational symbols in red.
6. A sequential program which outlines the processes by which an adolescent can move from concrete to more abstract operations is outlined in an article by Mrs. Alice Ansara, Head of the Reading Department, Manter Hall School, Cambridge, Mass. entitled "The Language Therapist as a Math Tutor," reprint from the 1973 Bulletin of the Orton Society. It can be purchased for 50¢ from the Orton Society, 8415 Bellona Lane, Towson, Maryland, 21204. The suggestions in this article are invaluable in working with the adolescent with arithmetic difficulties.
7. Texts for instruction in mathematics should be selected in terms of the charts and examples, as well as the overall structure. Long, very involved text explanations will not meet the individual's needs.

Instructional Area _____ Student's Name _____ School Year _____

Annual Goal _____

Short-Term Objectives

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress

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Annual Goal _____

Short-Term Objectives

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
273			274

WRITING PERCEPTION INTO THE IEP

These are Some Suggestions on How to Incorporate Perceptual Work into Academic I.E.P.'s

Stated in this Format They are All Measurable Through Some Academic Task.

AUDITORY

Auditory Attention

- will have favorable seating position in relation to teacher
- will watch teacher's mouth for visual clues
- will have a limited verbal presentation
- will have a reduction of visual and/or auditory stimuli
- will be given visual clues when possible

Auditory Discrimination: Phonics

- will discriminate vowel sounds
- will discriminate sounds in beginning, medial, and final positions
- will discriminate syllables (e.g. ag, ig, u)
- will identify rhyming words

Auditory Figure Ground

- will have a reduction of background noise
- will build tolerance to reintroduction of background
- will select relevant information from word problems
- will select relevant information from oral conversation

Auditory Synthesis

- will blend phonetic elements into syllables/words
- will blend syllables into words

L.D. Teacher, Marianne Tierney

Auditory Sequencing

will sequence sounds and syllables within words (spelling)

will sequence events in a story from oral presentation

will write from dictation

Auditory Memory
(Auditory Holding)

will recall definition (state which subject area)

will recall rules (name)

will recall general information (such as oz. in lb., days in year)

will summarize or retell a story

will recall details in a story

will follow oral directions

will recall specific content vocabulary (social studies, science, etc.)

will recite multiplication tables

will recall basic math facts

will say days of week, months of year

Auditory Reorganization
(Auditory Processing)

will orally be able to substitute/add delete sounds or syllables to form new words

will categorize information

will make judgments

will draw conclusions

Auditory Motor Integration

will follow oral directions

will take dictation

Auditory Visual Integration

will read orally

will follow printed directions

Auditory Visual Integration
(con't.)

will match visual stimuli (pictures)
to information presented orally

will proofread spelling

will proofread written work for
structural/syntactical errors (endings)

VISUAL

Visual Discrimination

will select visually-like letters,
syllables, words

will recognize basic similar sight
words (house - horse)

Visual Figure Ground

will read with an underliner

will track letters/words

will react to punctuation and indentation
that is color coded

will work math problems that have been
outlined with a felt tip marker

Visual Memory

will spell sight words

will recall sight words

Visual Sequential Memory

will proof copy from visual stimuli
(copy from board notes, math problems, etc.)

spelling

Spatial Relations

will line math problems on a page
(graph paper)

will convert horizontal math equations
to vertical equations

will write within lines on paper

will form manuscript/cursive letters
in proper relation to lines on paper

Visual Motor

will trace model letters and words

will write manuscript letters

will write cursive forms

will write upper and lower case letters

IN-SERVICE MEETING
READING OR ARITHMETIC?
WRITING THE PERCEPTION IIP
READING, MATHEMATICS TEACHERS

Monday, January 22, 1979
Two Allegheny Center
Resources Center
12:30 - 3:30

Evaluation

- OBJECTIVES:
1. To identify ways to remediate students' inability to solve word problems in arithmetic.
 2. To integrate perceptual training into arithmetic or reading instruction.
 3. To establish guidelines for writing perception IIPs.

- EVALUATION:
1. Which objectives were met? Not met?
 2. What experiences can apply in your instructional program?
 3. What else do we need to work on in the area of perception?
 4. Negative comments should be made here. What could have been done better? Give suggestions for improvement.
 5. Indicate your needs for future in-service programs.

WORKSHOP V

IN-SERVICE MEETING
BEHAVIOR MANAGEMENT WORKSHOP
READING, MATHEMATICS TEACHERS

Tuesday, February 13, 1979
Two Allegheny Center
Conference Center
12:30 - 3:30

Agenda

- | | |
|---------------|--|
| 12:30 - 12:40 | Overview of Workshop Activities |
| 12:40 - 1:00 | 1. Data Collection Form |
| | 2. Letter to Principals |
| 1:00 - 3:15 | 1. Film and Discussion-Lucille Naughton |
| | 2. Behavior Management and Reinforcement |
| | 3. Management Strategies |
| 3:15 - 3:30 | Wrap-up and Evaluation |

BEHAVIOR MODIFICATION TECHNIQUES

Definition: Behavior modification is an attempt to alter the learner's behavior by manipulating the response-reinforcement contingencies which are controlling his behavior.

I. Select a Target Behavior

- A. Target Behavior is a behavior one has selected to change.
- B. Behavior can be changed two ways.
 - 1. Cause it to occur more frequently.
 - 2. Eliminate it.
- C. Avoid labels and deal with observable behavior.
- D. Three considerations in selecting target behaviors.
 - 1. Define the behavior objectively and be specific in stating the goal.
 - 2. Be certain the behavior is relevant.
 - 3. Consider the target behavior similarity to what the child is already doing.

II. Find a Consequence

- A. Consequences are events (following a behavior) which increase the probability that the behavior will occur again.
- B. Must be individually selected.
 - 1. Knowing the child helps to determine the consequence.
- C. Consequences only applied when learning is an acquired behavior.
- D. Reinforced immediately after completion of the desired behavior.

III. Discuss and Clarify Arrangement

- A. Learner must be oriented to the contract.
 - 1. Discuss -
 - a. What are contracts and how they are used.
 - b. Create and interest in the agreement.
 - c. Be certain that all parts of agreement are clearly understood.

IV. Evaluation

- A. Once task is completed, performance must be evaluated to see if criteria has been met.
- B. See VI for further evaluation.

V. Fading

- A. Learner often needs physical guidance in the successful completion of a task.
 - 1. This process known as fading.

VI. Contracting

- A. An agreement between two parties which specifies:
 - 1. A requirement to be met.
 - 2. The consequences of the fulfillment of that requirement.
- B. Agreement can be various forms.
 - 1. Verbal.
 - 2. Written.
 - 3. Implied.
- C. Purpose of contracts.
 - 1. Manage academic behavior.
 - 2. Manage social (non-academic) behavior.
- D. Contracting is a process.
 - 1. Effective because it requires that achievable tasks and obtainable outcomes be specified.
- E. Three basic elements of contracting.
 - 1. Task Reinforcement
 - a. States that what the learner is to do in behavioral terms.
 - b. Should be stated in positive terms.
 - c. Task must be at a level where it can be mastered.
 - d. Task should be something that can be mastered in relatively short time.

2. Performance Criterion

- a. Criterion for success must be stated explicitly.

3. The Reward

- a. Should be a positive consequence.
- b. Reward depends on individual child (see handout for suggestions).
- c. Involve the learner in the contract.
- d. Must also be stated clearly in the contract.

F. What if contract is not fulfilled?

1. Reason for non-fulfillment will appear and contract needs to be revised to assure success.

POINTS TO REMEMBER ABOUT REINFORCEMENTChildren With Learning and Behavior Problems

By: William I. Gardner

Behavior followed by reinforcing events is likely to occur.

Reinforcers are those events which do, in fact, strengthen and maintain a child's behavior.

Events which are reinforcing to one child may not be reinforcing to another.

A child will learn new behaviors best if he is provided immediate reinforcement.

A child will learn new behaviors most rapidly if these are reinforced every time they occur.

Events which are reinforcing to a child at one time may not be reinforcing at another time.

Require as much behavior as the child is able to perform prior to reinforcement.

Whenever possible, use prompting procedures to get the desired behavior to occur.

If extinction procedure is used, there may be an initial increase in the frequency or intensity of the behavior which no longer is being reinforced.

Change in one behavior frequently leads to changes in other related behaviors.

New behaviors will persist if provided frequent intermittent reinforcement.

Teaching Children With Learning and Behavior Problems

By: Donald D. Hammill and Nettie R. Bartel

Avoid getting into a will-power struggle with a child. Someone will eventually have to lose face.

Assessment should provide an adequate description of the existing behavior.

Children sometimes exhibit deviant behavior because they have failed to learn in which situations certain responses are, or are not appropriate.

POINTS TO REMEMBER ABOUT REINFORCEMENT

Behavior management is not one specific method, but rather a family of techniques.

Soft reprimands have been proven to be much more effective than loud reprimands.

Nothing improves a person's hearing more than praise.

Always be sure that students know exactly what is expected of them.

State rules clearly. Review often. Reward when rules are followed.

Be consistent!

Sometimes the smallest things can be reinforcing to students (such as dusting erasers, passing out papers, opening the door when someone knocks).

Encouragement is oxygen to the soul.

Structuring the situation often times helps to structure the child.

We spend hours each day teaching, testing, diagnosing, and remediating academic areas. The area of emotional growth though is neglected when comparing it to other learning areas.

The growth process of personal skills seems to be one that comes by way of other growth and learning experiences.

Every day occurrences can be used as reinforcing events. (For example - John, I liked the way you listened to the directions I just gave you. Since you were such a good listener, would you do me a favor and take this message to Mrs. Smith? -or- You were ready first, so you may go to lunch first.)

It is a good idea to have a basic behavior management program running in the classroom at all times or for a great part of the day. This often provides students with a much needed familiar, dependable environment.

Behavior management techniques need not be complicated. Sometimes it helps to make it easy on yourself.

A teacher who is low-keyed and controlled will usually be able to maintain a low-keyed, controlled classroom.

It helps to let your students know you as a person. Let them know what you need from them. Let them know when they have helped you, when they have pleased you.

Remember, there are no "cookbook" recipes for changing students. Each child is an individual and will require a somewhat individual process.

I have yet to find a person who did not put forth greater effort under a spirit of approval than he would ever do under a spirit of criticism.

POINTS TO REMEMBER ABOUT REINFORCEMENTDeveloping Student Discipline and Motivation

By: Reed Martin and David Lauridsen

If you want to influence a change in behavior, you must first observe what is sustaining the behavior at its present rate.

If an action (whether good or bad) brings a response which the actor interprets as pleasant, it is likely the action will be repeated.

It is important that the behavior be an observable action so that we can objectively view it.

You are the most important part of your student's school environment. Your reaction to what they do influences each child's social and academic behaviors.

Social reinforcement will occur every day whether you intend it to or not. The question is whether you will be using it to advance each student's educational performance.

Always try to weaken the undesired behavior while strengthening the incompatible alternative - the desired behavior.

Many problems can be avoided if group rules are stated more clearly and enforced consistently.

Avoid so much mobility in the room that confusion results.

Do not throw out reinforcement as bait when things get out of hand. Specify well in advance how they are to be earned.

When distributing non-social reinforcers, include social praise.

Behavior Disorders: Helping Children With Behavioral Problems

By: A. Lee Parks

The behaviors of behavior disordered children are not that much different from the behaviors of "normal" children. The difference is primarily a matter of amount of behavior - not kind.

Lack of reinforcement deprives the child with the opportunity to learn.

Giving positive reinforcement once is not enough. You must be consistent day after day for a reasonable number of days. If the behavior has been around for a long time, it is going to take some time and energy to affect change.

There are social, activity, tangible, and token rewards.

Behavior is learned!

LIST OF REINFORCERSSOCIAL

"Good" call to parents
Good note sent home
Physical contact - Smile, standing close,
hug, nod, gentle touch, wink, squeeze
of the arm, pat on the back
Smile-O-Gram
Verbal praise (from adults) - Very good, I
like that, Nice job, Wow, Super, etc.

TOKEN

Stars
Chips
Points
Special cards
Play money

SHORT-TERM BEHAVIOR MODIFICATION TECHNIQUES

Long, Nicholas J., Morse, William C., and Newman, Ruth G.
Conflict in the Classroom: The Education of Children with Problems. Belmont, California: Wadsworth Publishing Company, Inc. pp. 442-452

Long and Newman, in "Managing Surface Behavior of Children in Schools" list twelve techniques which help a teacher in difficult situations. They are, however, only stop-gap methods and do not substitute for a planned, long-term approach.

1. Planned ignoring: if the behavior appears to be designed to annoy the teacher and will probably not spread to other children, ignoring serves to keep the child from getting what he wanted through misbehavior. Attending to him only teaches him how to annoy the teacher again when he desires it.
2. Signal interference: A variety of non-verbal signals are effective, if used at the beginning stages of misbehavior: eye contact, clearing one's throat, frowning, snapping fingers, gestures, etc.
3. Proximity control: It is effective to be near a child who is having difficulty; some children also need a touch, such as a gentle hand on the shoulder, to stop misbehavior.
4. Interest boosting: When a child is restless, showing interest in the child's assignment often helps, or talking to him about his personal interests.
5. Tension decontamination through humor: (NOT sarcasm) Humor clears the air and reduces anxiety and tension so the children can return to work.
6. Hurdle lessons: If the child meets a hurdle he can not get over, such as a hard part of a lesson, he is apt to become frustrated and engage in some motor activity; immediate noticing of his difficulty and giving him help over the hurdle will get him back on the tract.
7. Restructuring the classroom program: The teacher must be flexible enough to change her plans when she senses that the tension level of the class is too high. Draining off the tension through a different activity allows return to the planned program later.
8. Support from routine: A daily schedule, structure, and rules help the children to predict what is expected of them, gives them consistency, and reduces feelings of anxiety.

9. Direct appeal to value areas: Appealing to the child's group code, helping him to think how other children might react to his action, or pointing out the reality consequences of his behavior are several of the value areas to which teachers often appeal.
10. Removing seductive objects: Some objects are irresistible to children, making it harder for them to control their behavior.
11. Antiseptic bouncing: When the child has gotten to the point that he cannot respond to verbal controls, it is best to allow him to leave the room for a drink of water or to provide someplace where he can get himself together. This is not done to punish the child, but to help him.
12. Physical restraint: When a child loses control, it is frightening to him. This technique is not used for punishment but to keep the child from hurting himself or others. The restraint is firm but not rough.

The above techniques are always that teachers can interfere to stop undesirable behavior. It is also important that teachers make it clear to children what kinds of behavior are permitted in the classroom because specifying the allowed activities eliminates a lot of the child's need to test the limits to find what the rules are. Other kinds of behavior are not approved of by the teacher, but are tolerated because she knows it is a developmental stage or that it is a natural mistake when the child is trying to earn status in the group or learn a new skill or concept. Preventive planning is an on going evaluation by the teacher to consider whether her lesson plans, schedule, or classroom procedures contribute to disruptive behavior or whether they help prevent it.

CLASSROOM MANAGEMENT STRATEGY OUTLINE

1. What is the behavior problem? _____
2. Is it inappropriate for this child? _____
3. Under what conditions does it occur? _____
4. What is the frequency/duration of occurrence? _____
5. What usually precedes the problem? _____
6. What usually follows the behavior? _____
7. What outcome do you want? State it positively. _____
8. Does this involve:
 - a. decreasing in the frequency/duration of an old behavior?—_____
 - b. learning a new behavior? _____
 - c. BOTH? _____
9. What model of reinforcement will you use?
 - a. Direct reinforcement _____
 - b. Contingency contracting _____
 - c. Social modeling _____
10. Would you modify the conditions under which the behavior occurs?
 - a. Setting _____
 - b. Other students _____
 - c. Activity _____
11. Will you involve other professionals? _____
12. How often will you intervene?(reinforce, ignore, etc.) _____
13. What materials or other conditions are necessary to implement the strategy? _____
14. Additional comments and alternatives: _____

IN-SERVICE MEETING
BEHAVIOR MANAGEMENT WORKSHOP
READING, MATHEMATICS TEACHERS

Tuesday, February 13, 1979
Two Allegheny Center
Conference Center
12:30 - 3:30

Evaluation

- OBJECTIVES:
1. To identify strategies for managing student behavior in the classroom.
 2. To identify ways to reinforce desirable student behavior.
 3. To identify reinforcers that motivate.

EVALUATION: 1. Were the objectives met? Not met?

2. How ill you use today's experiences in your instructional program?
3. What could have been done better? What are your suggestions?
4. What are your needs in the area of improving children's attending behavior? Attending means attending to the instructional task.

WORKSHOP VI

IN-SERVICE MEETING
PERCEPTION AND THE OLDER STUDENT
READING, MATHEMATICS TEACHERS

Thursday, March 8, 1979
Two Allegheny Center
Conference Center
12:30 - 3:30

Agenda

12:30 - 12:40	Overview of Workshop Activities
12:40 - 1:40	Using the Controlled Reader
	Tape-Recorded Math Instruction
1:40 - 2:40	Motivating Older Students - Lucille Naughton
	Coping Strategies
	Survival Techniques for the Learning Disabled
2:40 - 3:15	Questions and Discussion
3:15 - 3:30	Wrap-up and Evaluation

LEARNING DISABILITIES
CHARACTERISTICS AND COPING TECHNIQUES

I. Memory

A. Characteristics of Auditory Memory Difficulties

1. needs to write everything down
2. poor speller
3. has difficulty in phonics - can't analyze and synthesize
4. leaves out syllables and can't divide words into syllables
5. has difficulty in lecture type classes

B. Coping Skills for Auditory Memory

1. let child use visual clues
2. have child write as he memorizes
3. use short, one concept sentences
4. write lecture material on board or let him copy teacher's notes

C. Characteristics of Visual Memory Difficulties

1. can't remember visual patterns
2. spells phonetically
3. can't remember visual notes
4. when reading, has to verbalize
5. difficulty with completion tests

D. Coping Skills for Visual Memory

1. use auditory aides and cues
2. let the child trace
3. use configuration cues
4. allow the child to verbalize as he reads
5. provide partial visual cues on completion tests
6. use multiple choice or true and false tests

II. Visual Skills - Discrimination, Figure Ground, Tracking, Analysis, Synthesis and Integration

A. Characteristics of Child with Visual Perceptual Difficulties

1. can see but can't differentiate
2. confuses letters or word parts
3. poor visual discrimination
4. prefers auditory activities such as listening tasks
5. difficulty retaining visual sequences
6. difficulty skimming for details
7. difficulty copying from the board

8. difficulty following written directions, can't find directions or can't discriminate key direction words
9. can't keep own place when reading orally or silently
10. can't keep place while listening to oral reading
11. spells phonetically
12. difficulty with matching or multiple choice tests

B. Coping Skills for Visual Problems

1. use short visual units
2. teach isolated sounds, use a phonetic reading approach
3. teach sound, not letter names
4. teach word families
5. use anagrams to build words - use many manipulative materials
6. use auditory cues in giving directions
7. permit tracing
8. use marker while reading
9. circle or underline details
10. read comprehension questions before reading a passage and underline answers as they are found
11. box off written directions
12. use completion or oral tests
13. give the choice of copying from the board or from teacher's notes
14. let the child auditorize as much as possible

III. Auditory Skills - Discrimination, Figure Ground, Analysis, Synthesis, Integration

A. Characteristics of Auditory Problems

1. can associate whole words with symbols
2. can't relate visual components
3. can't relate parts to a whole
4. difficulty hearing differences within words
5. can't reauditorize sounds
6. prefers visual activities
7. may be agitated when room is noisy
8. can't follow oral directions
9. can't attend to auditory stimuli like lectures

IV. Motor, Spatial, Temporal and Social Difficulties - Non-Verbal L.D.

A. Characteristics of Non-Verbal Difficulties

1. can't comprehend aspects in the environment
2. misinterprets social cues
3. poor body image
4. poor directionality
5. poor laterality
6. lacks dominance
7. difficulty making social judgments
8. difficulty sequencing events
9. can't take matching tests

10. unprepared for class, often loses things
11. difficulty with separate answer keys
12. poor in group situations
13. can't tell time
14. may be distractible or hyperactive
15. disorganized in all areas

B. Coping Skills for Motor Difficulties

1. supply organization with skeleton outlines, notes and divided notebooks
2. use digital clocks
3. use graph paper
4. allow use of times table
5. use a ring or chart or some clue for remembering right hand
6. supply tests with exact amount of answer blanks
7. verbalize a visual plan
8. play charades
9. verbalize directions
10. provide spatial cues

V. Language

A. Characteristics of Receptive Language Difficulties

1. can't recall or retain information
2. doesn't comprehend spoken language
3. can't follow directions
4. can't conceptualize, does better on concrete tasks
5. looks confused
6. lacks general knowledge

B. Coping Skills for Receptive Language

1. reduce amount of language
2. structure the auditory environment
3. relate words with experience
4. teach whole words
5. supply repetition

C. Characteristics of Expressive Language Difficulties

1. can't retrieve words, dysnomic
2. difficulty labeling
3. defective syntax, formulation and composition
4. concrete, difficulty abstracting
5. weak on written language tasks
6. often nonresponsive in group discussion
7. difficulties with easy or completion tests

D. Coping Skills for Expressive Language

1. use meaningful words
2. describe objects by attributes
3. read silently more often
4. give visual cues
5. use words in context
6. give multiple choice tests
7. provide language structure for composition

E. Characteristics of Motor Integration Difficulties

1. can't say words, can't imitate
2. can't think through the motor plan for talking
3. confuses word order and syllable order

F. Coping Skills for Motor Difficulties

1. teach phonemes and morphemes
2. use pictures of mouth movements
3. use a meaningful vocabulary

G. Characteristics of Written Language Difficulties

1. poor syntax
2. poor phrasing
3. lacks knowledge of mechanics of written language
4. poor spelling
5. misuses homonyms
6. descriptive, lacks creativity and imagination

H. Coping Skills for Written Language

1. use transformational/generative method of teaching language
2. teach language patterns
3. use manipulative materials - words to build sentences
4. teach recognition of defective mechanics - proofreading
5. expand stories by discussing them orally with child

SURVIVAL -- REGULAR CLASSROOM TECHNIQUES FOR THE
INDIVIDUAL WITH LEARNING DIFFICULTIES

1. Some students have difficulty comprehending what they read or organizing their ideas, knowing where to find information in the textbook and how to effectively use it. Explanation of the following can be important -- (Ansara -- Bulletin Orton Society, 1972)
 - a. use of appendix and indexes in the text
 - b. understanding and use of glossary for definitions of terms
 - c. organization of the text and chapter titles
 - d. use of main and subordinate headings
2. A teacher-made outline can be helpful for students who have great difficulty pronouncing words and thus obtaining the meaning of what they read. This may include:
 - a. the title of the chapter
 - b. subordinate headings
 - c. key statements with key words
 - d. a brief question posed by the material

Short sentences with key words can be the principal outline. (Ansara -- Bulletin, Orton Society, 1972)

3. Before reading the chapter, it is helpful for the student to turn to the end of the chapter for the discussion section to see how many questions can be answered before reading it. It also helps to provide a structure in the student's mind as to the direction and focus of the material that is to be presented in the chapter itself.
4. The individual with learning problems needs to know how to organize, set up the notebook, and prepare pages before the class begins. Studying the text examples, particularly for items in science and math, is helpful-- analyzing the example step by step and how to set up another problem using the original as a mode. (notes: Ansara)
5. The purpose for reading should be stated clearly and directly, avoiding vague and ambiguous terms. For example, rather than asking the student to "Read to find out about the causes of nationalism in the last century" it is better to state "Find the five main causes for the rise of nationalism in Germany, Austria, Hungary, and Poland during the period from 1870 to 1910." The important concept is to give the student a clearly stated, directed purpose for the reading. Although this particular example is at the conceptual level of the adolescent, the principle also applies in work with younger children. The clearer the purpose is stated, the easier it is for the student to obtain the information that he needs.

6. The text can also be "prepared" for the student by penciling, circling, or underlining key words, unknown words or word parts that are difficult for him to pronounce. Many students have difficulty pronouncing the medial sections of words, vowel teams, etc. Note how the section below has been prepared."*

From If by Rudyard Kipling

"-----If you can meet with Triumph

and Disaster

And treat those two imposters just the same:

If you can bear to hear the

truth you've spoken

Twisted by Knaves to make

a trap for fools-----"

7. Selections of the text can be put on cassette for review, for oral discussions, or for the student to use to follow along with his reading.*
8. Grading sometimes needs to be restructured. For example, although the science teacher may supplement or offer suggestions for handwriting, the student should be graded in science for the quality of his ideas presented in the class. Some compensations must often be made for the student who has difficulty expressing his ideas in writing. For such a student multiple-choice questions or true-false items can be used for testing and oral presentations, pictures, or special built or graphed projects for criteria of performance. True-false items are also important to use to evaluate the student who has difficulty expressing his ideas orally.*
9. Work and time should be carefully structured so that the student knows clearly what he is to do and learns to use time wisely and effectively.*
10. Group for the student what he is to remember --*
- a. spelling words in categories
 - b. reading items in categories for blending, syllable division and accent
 - c. lists of words, numbers or directions should be presented in meaningful categories
11. Verbal instructions given by the teacher may need to be stated simply, repeated, and reviewed.
12. Review frequently what the student is asked to remember.

13. It is important to note that memory is strengthened by reward. When the student has mastered or remembered a concept or item with which he has previously had difficulty, praise him for it, give him "free" time or select another relevant reward.*
14. Make sure by asking for repetition or if he understood the directions to see if the student understands what he is to remember. However, don't talk "down" to the individual, reprimand him in front of his peers, or become involved in power struggles.*
15. If the student has difficulties in attention and interest, establish alternatives or reward systems.*
16. Teach the student how to use reference guides in the classroom and library--dictionaries, encyclopedias, English guides, thesaurus, "bad spellers" dictionaries--but do teach spelling.
17. Build upon what the individual already knows, his previous experience with words and ideas. (notes--Ansara)
18. Work through the steps of a problem inductively so that the student develops the rules for himself to insure recall and generalization. Rote memorization of rules does not provide well for effective recall and concept formation.
19. Build associations in various categories of learning, in various subject matters.
20. Team students for projects. For example, the individual who has difficulty writing a paper can design a mural, picture guide, display, experiment, etc., working with another student who is efficient at writing. The previous student provides the background and the concepts for the paper--together with his fellow students.
21. Teach word histories and word origins which the student may keep in a notebook for reference.
22. Allow the student to mark, underline or take notes in his book. His learning and recall is more important than the value of the book.*
23. Have the student keep an assignment book or a page in the indexes under the subjects in his notebook for him to write down his assignments or particular items he has to remember.*
24. For homework purposes quality rather than quantity is the dictum. A student, for example, does not need to do 50 problems to prove that he understands the concept. Problems given several at a time on cards are less of a threat also than an entire page of arithmetic problems which the student may look at and immediately give up on. Then if the teacher believes it is necessary to assign many problems, giving them in the manner just mentioned will pose less of a threat to the individual.*

25. Some students can understand or complete their work accurately but need additional time to finish. Allow the student to take the book home, with directions and structure carefully worked out ahead of time with the student. This is particularly true for students with reading difficulties. It is also important to remember for formal and informal tests or measures of the student's progress. The individual with learning problems may often "freeze" under the pressure of time and forget what he really knows.*

* C. Czerniejewski

DEVELOPING WRITING - COMPOSITION SKILLS

The following procedures are often useful for the student who has difficulty expressing his ideas in writing.

1. Learning to classify words in categories aids in developing foundations for writing skills.

WORD CATEGORIES

<u>Naming</u>	<u>Doing</u>	<u>Describing</u>	<u>Intensifying</u>	<u>Qualifying</u>	<u>Quantifying</u>
table	ran	red	quickly	but	bigger
happiness	thought	beautiful	loudly	although	more than
honor	considered	colorful	thoughtfully	nevertheless	less than
justice	believed	interesting	sincerely		

2. Words can be classified in terms of their function in the sentence.

Example

- a. He is running down the street.
b. Running daily is good exercise.

3. From word classifications the student can also evaluate sentence patterns and classes:

Example

- Pattern 1 --- Susan gave Mother a present.
Pattern 2 --- Is the answer correct?
Pattern 3 --- Make yourself comfortable.

4. From a simple sentence new words can be added for longer and more complex sentences.

Example

- a. The boy is running.
b. The man is running.
c. The boy is running down the street.

- d. The man is running down the street.
- e. ~~The~~ boy and the man are running down the street.
- f. The little boy and the big man are running down the street.

In the above case new nouns and supporting words are centered around the verb. Build knowledge of verbs from the concrete to the abstract so that substitutions can be made in sentence patterns.

- 5. Gradually the student can progress to expansions upon the basic sentence with subordinate and coordinate clauses.

Example

Make yourself comfortable if you find yourself getting tired.

- 6. Rearranging sentences with a variety of clause constructions can assist in developing sentence expansions and variety.

Example

- a. When the settlers reached the Pacific Northwest, they found life to be very difficult.
- b. The settlers found life to be very difficult when they reached the Pacific Northwest.

and use of common phrases

Complete the sentence:

_____ as good as _____.

- 7. Sentence completions using analogies can also be helpful as in:

Example

- a. The boy was quick as a _____.
- b. The candy is as hard as a _____.

- 8. The student can be assisted in detecting errors also by another technique where the teacher writes sentences containing several errors, reads them to him, and asks him if the sentences as read are the same as the ones he sees.

Example

As written

It is next impossible to find out everything you want to know.

As read

It is next to impossible to find out everything you want to know.

- (1) Ref: Myklebust and Johnson, Learning Disabilities and Practices, Chapter VI

9. At the beginning one may start with simple descriptions from the verb core, expanded upon in terms of support with examples, opinions, analogies, etc. A variety of expansion should be taught so that the student is able to start with examples and then end with a topic sentence. Development of comparison and contrast aids in developing skills in word usage.
10. From simple definitions and descriptions proceed to develop skills in opinion and proposition writing in gradual steps of difficulty.
11. Learning to take notes in phrase and sentence form is an aid in developing writing skills, linking the receptive process of reading with the expressive process of writing. Skills for reading and writing should be taught together as they are interrelated skills.
12. It is important to remember that the student may well forget the names of the parts of speech; it is important that he remember how to use and organize his ideas in writing. Select books which concretize or picture the parts of speech vividly. Use of pictures helps some students particularly if they have difficulty thinking of what they want to say.
13. Sometimes the student may need to dictate his ideas to the teacher. They can then be copied when needed, expanded upon, and read back orally.
14. Writing should proceed in developmental sequences through oral language as a frame of reference, how placement of words in a sentence can change the meaning, how the structure develops a thought. Work from oral language to written word from a verb to expansions, from categories of words to phrases to sentences and then to paragraphs.
15. Arrows can be used to show the relationship of words in sentences to reinforce understanding of word categories and word functions.

Example

The small, brown squirrel has climbed to the top of the tree.
(notes: Ansara)

16. Punctuation can be developed through analysis of signal phrases which occur in oral language, by rereading what is written and having the student analyze whether or not what he has written makes sense in his oral language as a frame of reference. Reading orally what has been written, following along with a pencil, helps to reduce omissions and substitutions which may sometimes occur.
17. Teach transitional words and phrases used for linking and have the student keep a reference list with examples of each in a notebook. The list may include:

- a. words referring to words already mentioned (demonstrative and personal pronouns): this, that, these, those, he, she and it
- b. words of time: meanwhile, later, eventually, sometime, afterward, finally
- c. words of number: first, second, in the first place
- d. words which signal a continuation of thought: furthermore, like-wise, for example
- e. words that contrast: but, then, nevertheless, still, however, on the other hand, yet
- f. words that develop certainty: undoubtedly, indeed, probably, in all likelihood
- g. words that compare: like, as, etc.

For exercises in use of transitional words the teacher may distribute sentences or paragraphs lacking transitional words. In addition, the student may select one of his own compositions and underline every transitional word he has used.

Another technique is to put several sentences on the board and have the student analyze how they could be linked with transitional words.

Example

Blacky was a beautiful horse. We lived on a ranch. There was a young cowboy on the ranch. He needed money. One day he stole Blacky. He sold Blacky to another ranch. This ranch was many miles away.

As rewritten

Blacky was a beautiful horse who lived on a ranch. A young cowboy who also lived on the ranch, needed money so one day he stole Blacky and sold him to another ranch which was many miles away.

Have the student develop paragraphs using transitional words, reading orally before making changes to note the difference in the flow of words when transitional or linking words are added.

18. Some students have difficulty varying verbs, phrases, and sentence style. They need to develop more vividness in written expression.

Example

Select a paragraph from a writing selection substituting weak verbs for the student to analyze, deleting modifiers and just leaving the bare core. Have the student try to reconstruct it. Then show the original sentence or paragraph as it was written.

Sample

The night was dark. It had no stars. There was thunder and lightning in the sky.

Original

"Dark and tempestuous was night. Around the throne on high not a single star quivered; but the deep intonations of the heavy thunder constantly vibrated upon the ear; whilst the terrific lightning reveled in angry mood-----."

19. Many adolescents enjoy contemporary rock and folk songs, and these can be used in developing writing skills (and reading skills as well) through analysis of words and phrases, style, variety of usage, etc.

Note for example the following selections and possibilities for their uses, particularly in developing vividness in writing through the use of comparisons, etc.

From Tumbleweed by Douglas Van Arsdale

"I feel like a lonesome tumbleweed
rolling across an open plain,
I feel like something nobody needs
I feel my life drifting away."

The song above shows mood (read between the lines), comparison (life drifting away like a tumbleweed), comparison (no one needs a tumbleweed and no one needs him.)

or

From Summer Breeze by Seals and Crofts

"Summer breeze makes me feel fine
Blowin' through the jasmine of my mind
Blowin' through the jasmine of my mind---"

The song shows mood (joy or quiet pleasure, read between the lines), comparison and emotional tone (mind feels as clear as the scent of jasmine, etc.)

IN-SERVICE MEETING
PERCEPTION AND THE OLDER STUDENT
READING, MATHEMATICS TEACHERS

Thursday, March 8, 1979
Two Allegheny Center
Conference Center
12:30 - 3:30

Evaluation

- OBJECTIVES:
1. To review materials which were appropriate for older students.
 2. To identify and discuss strategies for motivating older students.
 3. To provide some insight into the coping strategies of children.

- EVALUATION:
1. Which objectives were met? Not met?
 2. What experiences can apply in your instructional program?
 3. What else do we need to work on in the area of perception?
 4. Negative comments should be made here. What could have been done better? Give suggestions for improvement.
 5. Indicate your needs for future in-service programs.

APPENDIX 6

Perception Handbook 288

INTEGRATING PERCEPTION INTO THE REMEDIAL PROGRAM

A PERCEPTION HANDBOOK FOR
READING SPECIALISTS AND
MATHEMATICS TEACHERS



Non Public Schools Program

Act 89 Auxiliary Services

September 1979

Allegheny Intermediate Unit
Suite 300 Two Allegheny Center
Pittsburgh, Pa 15212

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The groundwork for this handbook was laid by a committee of six teachers who wrote Guidelines for the Identification and Amelioration of Problems in Perception in Reading and Mathematics in June 1978. Sincere thanks are extended to Cynthia Rush who chaired and guided the committee so ably. Thanks are extended to the teachers who offered their input: Lillian Casper, Jean Fava, Deborah Furda, Nancy McFadden, and Margaret Vaughn. The guidelines served as a resource while the program of perception was being developed and implemented.

Sincere appreciation is expressed to the teachers who participated in the development, implementation and evaluation of the project. Special thanks go to the ten teachers who volunteered to teach the study group. The evaluation of the project relied on the data which they accumulated during the field test. They are: Noreen Begg, Doug Brindle, Lillian Casper, Deborah Furda, Sally Reichard, Cynthia Rush, Barbara Wieserman, Brenda Anderson, Jane Carothers, and Janice Davidson.

FOREWORD

To the remedial teacher:

The content of this handbook is intended to help you provide remedial instruction in reading or arithmetic. Many of the children in the remedial program have perceptual deficits which interfere with learning. The materials will help you recognize those perceptual deficits. Just as important is the child's learning modality. Some children are visual learners. Others are auditory learners. Your teaching will be more effective if you teach the child through his stronger modality.

While problems in perception persist, many children have learned to compensate for them by the time they have reached the upper elementary grades and are coping with their "deficiencies." Before treating a problem in perception, be sure that you have significant evidence of need. Be sure that your treatment is educationally sound.

The instruments which have been identified as screening tests may be administered by any reading specialist or by a mathematics teacher who has had experience with the test. If a test has just been given to a child by the speech clinician, the school psychologist, or any other competent testor, please confer with that person before administering a similar test and before writing an instructional program for the child.

Under no condition should a student be labeled as dyslexic, learning disabled, or perceptually impaired. Labels "stick" to children and tend to absolve teachers of their responsibility for teaching. We are committed to teaching reading or mathematics skills to a student whether or not he has perceptual problems.

Since all of our students are in the program for instruction in either reading or mathematics (or both), perception will be dealt with as part of the instructional program only when it interferes with a child's progress in one of the skill areas. The treatment of problems in perception will not negate the primary responsibility of teaching reading or mathematics. Instead, it will eliminate some of the barriers to students' progress in the basic skills.

The handbook is divided into 6 chapters. The first chapter briefly describes the learning disabilities approach to remediation which provides the rationale for integrating perception into the remedial program. Chapter 2 defines the perceptual skills which have been identified for treatment by the teachers. Chapter 3 provides insights into how to identify perceptual strengths and needs. Teaching to the child's modality is described in Chapter 4. Chapter 5 provides specific suggestions for remediating perceptual deficits. The Matrix of Perceptual Treatments (pp. 327-328) lists specific materials for teaching to the child's modality or for remediating his perceptual deficits. Only materials that are in the remedial program are included. All of the suggestions included in the handbook are oriented toward remedial instruction by itinerant teachers in mobile classrooms. Chapter 6 includes guidelines for writing a perception IIP. The glossary includes the vocabulary from the field

of learning disabilities. The list of teacher resources in the appendix includes books which contain specific teaching activities for remediating reading, arithmetic and perceptual skills.

CHAPTER I

PERCEPTION IN THE REMEDIAL PROGRAM

The Current Disabilities View

Theorists and practitioners in the fields of reading and learning disabilities are stressing the importance of knowing which perceptual channels are debilitated and which channels are intact and can be used for instruction. Johnson and Myklebust¹, de Hirsch, Jansky and Langford², and Whitsell³ have concluded or have advocated that perceptual strength and weakness should largely determine the teaching methods for individual children. A profile of the child's sensory motor and perceptual capacities will indicate which input systems are most intact and available for learning as well as the weak functions which need support and development.⁴ General guidelines for remediation by Kirk and Kirk recommend that children be taught through channels of sensory strength and that prerequisite deficiencies be remediated.⁵ For example, if a child is a visual learner

¹Doris J. Johnson and Helmer R. Myklebust, "Dyslexia in Childhood," in Learning Disorders, Vol. 1, edited by Jerome Hellmuth, (Seattle, Washington: Special Child Publications, Bernard K. Straub Publishers, 1965), p. 264.

²Katrína de Hirsch, Jeanette Jefferson Jansky and William S. Langford, Predicting Reading Failure, (New York: Harper & Row, 1966), Chapter 5, p. 82.

³Leon J. Whitsell, "A Clinic Team Approach to Reading Problems: Role of the Neurologist," in Perception and Reading, edited by Helen K. Smith, pp. 72-77, (Newark, Delaware: International Reading Association 1968), p. 74.

⁴Samuel A. Krik and Winifred D. Kirk, Psycholinguistic Learning Disabilities: Diagnosis and Remediation, (Urbana, Illinois: University of Illinois Press 1971), p. 121.

⁵Ibid.

and lacks the auditory skills necessary to take spelling dictation, then spelling should be taught through a visual mode and the perceptual skills of auditory analysis, auditory synthesis, and auditory memory should be remediated with spelling and reading materials rather than with adjunct perceptual materials. A child with an auditory deficit should not be given math instruction solely in the auditory mode. Rather than giving a taped lesson, the teacher should intervene and demonstrate the math process. The child should have the opportunity to use his stronger sensory input modes (visual and kinesthetic) to experience new learning. The remedial teachers must teach to the major modality of the child and remediate the perceptual deficits which are prerequisite to reading and arithmetic skills.

Rationale for Accepting Disabilities View

Not all deficits in perception have a neurological basis and can be remediated to some extent. Kirk and Kirk suggest that

...among the culturally different or economically disadvantaged we find some deficits which are probably due to disuse and lack of training rather than to neurological origins. How irreversible these deficits are remain to be seen. It seems reasonable to expect, however, that early attempts to alleviate these deficits will bear fruit.⁶

The authors go on to say that even when disabilities are neurologically related "it is likely that the behavioral deficits become exaggerated because of avoidance and can be improved through remediation."⁷

One cannot ignore perception problems such as reversals in reading and the inability to reproduce a number sequence in arithmetic. Reading

⁶Kirk and Kirk, p. 122.

⁷Ibid.

and arithmetic are not unitary skills. Each necessitates the acquisition and integration of several skills that depend upon the normal functioning of a number of psychological processes including visual and auditory perception. The learning disabilities approach to remediation has been adopted for this program. Each child should be taught new skills through his stronger modality or sensory input channel. Perceptual deficits should be remediated with reading and arithmetic materials rather than with adjunct perceptual materials.

CHAPTER II

PERCEPTION SKILLS

The following perceptual skills have been identified for treatment in the remedial program. Each skill is defined below. The skills are restated as terminal behaviors on the pages that follow.

Perceptual Skills Identified for Treatment

The perceptual skills which were identified for treatment are enumerated and described below:

1. Visual discrimination of structural details refers to the recognition of (matching and/or choosing) parts of words or parts of a numeral or number sentence.
2. Visual orientation of details refers to the directionality of specific numbers and letters: b, d, p, q, 4, 7, 9, 6.
3. Visual discrimination of sequence refers to the recognition of the order of letters, numbers, words, or sentences.
4. Visual figure-ground discrimination is the ability to attend to the visual stimulus object while blocking out the background.
5. Visual memory refers to the ability to recall visual stimuli.
6. Visual attention is the ability to attend to visual stimuli for a sustained period of time.
7. Visual motor ability here refers to the ability to combine visual skills with the motor skills needed to produce legible handwriting.
8. Auditory discrimination is the ability to recognize (match or differentiate) auditory stimuli.
9. Auditory synthesis refers to the ability to blend sounds to form words.

10. Auditory analysis consists of breaking down words into their component sounds.
11. Auditory figure-ground discrimination is the ability to attend to the stimulus sound and to block out extraneous sounds.
12. Auditory sequencing is the ability to recognize the order of sounds in words, words in sentences, number sequences, etc.
13. Auditory memory is the recall of auditory stimuli such as a group of spoken words or numbers.
14. Auditory attention is the ability to attend to the auditory stimuli for a sustained period of time.

PERCEPTION OBJECTIVES

Visual Perception

- V-1 Visual discrimination of structural details Given a visual stimulus word from a constant near point of reference, the student will identify the same word among a group of distractors.
- V-2 Visual orientation of details Given a brief exposure to a series of visual stimuli in the form of letters, numerals, words, and geometric forms from a near point, the student will write each form with the correct directionality.
- V-3 Visual discrimination of sequence Given a visual stimulus of a group of sentences from a far point of constant reference, the student will write the sentences in their correct order.
- V-4 Visual figure-ground discrimination Given a visual stimulus of a printed word or a five-digit numeral, the student will select the same word or numeral from among a group of distractors.
- V-5 Visual memory Given a brief exposure to a visual stimulus of two-, three-, four-, or five-letter words or numerals, the student will write the form with reasonable accuracy.
- V-6 Visual attention Given a visual stimulus which requires a specified period of attention which is reasonable in terms of the child's age, maturation, etc., the student will attend until the task is completed.
- V-7 Visual motor (Handwriting) Given a visual stimulus of a group of letters, words, numerals, or sentences, the student will write the stimulus forms with reasonable legibility and within a reasonable period of time.

Auditory Perception

- A-1 Auditory discrimination Given a pair of sounds auditorily, the student will tell whether they are the same or different.
- A-2 Auditory synthesis Given phonemic elements auditorily, the student will combine the phonemes to make a word or a nonword.
- A-3 Auditory analysis Given a spoken word, the student will identify initial, final, and medial phonemes.
- A-4 Auditory figure-ground Given an auditory stimulus against a background of sound, the student will make the appropriate verbal or written response.

- A-5 Auditory sequencing Given a sequence of auditory stimuli, the student will make the appropriate verbal or written response.
- A-6 Auditory memory Given an auditory stimulus, the student will demonstrate auditory memory by repeating the stimulus item or by writing an appropriate response.
- A-7 Auditory attention Given auditory stimuli requiring a reasonable period of attention, the student will attend until the task is completed.

Reasonable in the above objectives means appropriate for the individual when age, maturation, and other factors which affect learning are taken into consideration.

Perception Terminology

The following self administered exercises may be used as a "refresher" course for remedial teachers or as an orientation to the perception program for new teachers. The exercises are most effective when they are completed by two or three teachers who try to arrive at a consensus on each answer. The key permits self-checking.

SKILLS IN VISUAL AND AUDITORY PERCEPTION

By working through this exercise, you will become familiar with some of the terms used to identify skills within the areas of visual and auditory perception. Use the following abbreviations for the terms:

Visual Discrimination of Structural Details	V D Str D
Visual Discrimination of Orientation	V D Or
Visual Discrimination of Sequence	V D Seq
Visual Memory	V Mem
Visual Figure-Ground Discrimination	V Fig-Gr
Visual Attention	V Atten
Auditory Discrimination	A Dis
Auditory Analysis	A Analy
Auditory Synthesis	A Syn
Auditory Sequence	A Seq
Auditory Memory	A Mem
Auditory Figure-Ground Discrimination	A Fig-Gr
Auditory Attention	A Atten

Identify each behavior as one of the perception skills listed above. Use abbreviations. There is one behavior for each skill.

- _____ 1. Confuses d and b; p and q.
- _____ 2. Distinguishes between the letter A and the numeral 4.
- _____ 3. Arranges magnetic numerals in order.
- _____ 4. Writes four-digit numeral that has been flashed momentarily.
- _____ 5. Looks into the eyes of the speaker.
- _____ 6. Traces over numerals which are superimposed one upon another.
- _____ 1. Listens for the words of a song.
- _____ 2. Recognizes a wrong tone or "clinker" in a melody.
- _____ 3. Identifies the sounds in a spoken word.
- _____ 4. Repeats a ten-word sentence after hearing it spoken.
- _____ 5. Identifies the two rhyming words in a group of three spoken words.
- _____ 6. Waits for the next "Simon says" direction.
- _____ 7. Combines sounds to make a word.

Check your answers against the key that follows exercise 3.

SKILLS IN VISUAL PERCEPTION

Read each behavior. Identify it according to the visual skills listed on the preceding page. Each skill has three behaviors that exemplify the skill. Label each behavior with the abbreviation of the skill it best exemplifies.

- _____ 1. Looks into the eyes of the speaker.
- _____ 2. Names a four-digit number that has been flashed momentarily.
- _____ 3. Confuses d and b; p and q.
- _____ 4. Arranges magnetic numerals in order.
- _____ 5. Locates a specific item in a collage.
- _____ 6. Locates two identical birds among a group of four.
- _____ 7. Names items which have been shown for a few seconds and then removed from sight.
- _____ 8. Watches an ant carry away a food particle.
- _____ 9. Identifies a hidden figure in a drawing.
- _____ 10. Confuses letters r and n; n and h; a and d.
- _____ 11. Distinguishes between the letter A and the numeral 4.
- _____ 12. Numerals are written in a neat column.
- _____ 13. Recites the numerals and letters on a license plate that has just passed by.
- _____ 14. Orders a set of objects from smallest to largest.
- _____ 15. Watches the television screen intently.
- _____ 16. Traces over numerals which are superimposed one upon another.
- _____ 17. Traces over an outline of a frog.
- _____ 18. Maintains a left margin on a written paper.

Check your answers against the key that follows exercise 3.

SKILLS IN AUDITORY PERCEPTION

Read each behavior. Identify it according to the auditory skills listed on the preceding page. Each skill has three behaviors as examples of the skill. Label each behavior with the abbreviation of the skill it best exemplifies.

- _____ 1. Identifies the two words that rhyme when given a series of three words.
- _____ 2. Combines sounds to make a word.
- _____ 3. Identifies the number of syllables or parts in a spoken word.
- _____ 4. Listens attentively to the story-teller.
- _____ 5. Hears whispered secret above the playground noise.
- _____ 6. Follows the next "Simon says" order correctly.
- _____ 7. Adds ing to a spoken word.
- _____ 8. Writes correctly a five-digit numeral which has been dictated.
- _____ 9. Identifies the phonemes in a spoken word.
- _____ 10. Identifies the louder of two sounds.
- _____ 11. Hears the difference between the words forty and fourteen.
- _____ 12. Combines letter sounds to make "nonsense" words.
- _____ 13. Writes number sentences from dictation.
- _____ 14. Recognizes a "clinker" or wrong tone when musician plays a melody.
- _____ 15. Hears the words of a song on the radio.
- _____ 16. Waits without talking for the next "Simon says" direction.
- _____ 17. Listens to the background music rather than the actors' dialogue during a film.
- _____ 18. Hears the incongruity in "up-down-sided".
- _____ 19. Listens as teacher dictates the next multiplication problem.
- _____ 20. Anticipates the last word in a spoken verse.
- _____ 21. Identifies the suffix in a spoken word.

Check your answers against the key that follows exercise 3.

KEY

SKILLS IN VISUAL AND AUDITORY PERCEPTION

Exercise 1

1. V D Or
2. V D Str D
3. V D Seq
4. V Mem
5. V Attn
6. V Fig-Gr
1. A Fig-Gr
2. A Seq
3. A Analy
4. A Mem
5. A Dis
6. A Attn
7. A Syn

Exercise 2

1. V Attn
2. V Mem
3. V Or
4. V Seq
5. V Fig-Gr
6. V D Str D
7. V Mem
8. V Attn
9. V Fig-Gr
10. V D Str D
11. V D Str D
12. V Or
13. V Mem
14. V Seq
15. V Attn
16. V Fig-Gr
17. V Seq
18. V Or

Exercise 3

1. A Dis
2. A Syn
3. A Analy
4. A Attn
5. A Fig-Gr
6. A Mem
7. A Syn
8. A Mem
9. A Analy
10. A Dis
11. A Dis
12. A Syn
13. A Mem
14. A Seq
15. A Fig-Gr
16. A Attn
17. A Fig-Gr
18. A Seq
19. A Attn
20. A Seq
21. A Analy

CHAPTER III

IDENTIFYING PERCEPTUAL STRENGTHS AND NEEDS

Observable Classroom Signals

Observable classroom behaviors signal problems in visual perception.

Observe the child who:

1. Reverses or inverts letters or numbers.
2. Has poor handwriting.
3. Is unable to make visual discriminations.
4. Has difficulty remembering a number or letter sequence.
5. Drawings are lacking in detail.
6. Has difficulty with visual analysis and visual synthesis.
7. Has difficulty with visual sequencing.
8. Has slow-rate of perception.
9. Prefers auditory activities.
10. Has difficulty with certain games and sports.

Observable behaviors signal problems in auditory perception. Observe the child who:

1. Has poor language ability.
2. Exhibits speech deficits.
3. Mispronounces common words.
4. Does not follow simple spoken directions.
5. Cannot match rhyming words.

6. Does not discriminate among sounds.
7. Cannot blend sounds.
8. Cannot clap a simple rhythm pattern.
9. Is unable to carry a tune.
10. Cannot keep time or march to music.

A combination of deficits or deficit behavior over a period of time indicates the need for perceptual screening.

Identification of Specific Deficits
by Teacher Observation

Teachers are often able to identify areas of perceptual weakness without administering tests. How a student performs some of his daily tasks gives clues to his perceptual deficits.

Visual Perception

1. Attends to irrelevant details
2. Cannot organize materials.
3. Loses place frequently when copying/reading.
4. Has difficulty cutting, coloring, pasting.
5. Does not discriminate difference in size, shape, color, perspective.
6. Has difficulty recognizing common objects when a part is missing.
7. Cannot relate pictures to parts of stories.
8. Does frequent blinking or squinting; redness of eyes.
9. Makes common visual errors of omissions, reversals, substitutions, insertions made consistent.
10. Cannot remember stories from film or T.V.
11. Has general confusion in environment for work and play.
12. Has difficulty copying and/or tracing.
13. Cannot identify and separate foreground objects from background.
14. Has difficulty in spatial perception.
15. Cannot discriminate specific letters or directionality of specific letters (reversals).
16. Cannot remember names of letters.
17. Cannot remember sight words.
18. Cannot see structural relationships, little words in big suffixes.

Auditory Perception

1. Squirms and wiggles during entire oral story.
2. Cannot learn simple rhymes and riddles.
3. Does not recognize rhyming words.
4. Cannot detect change in loudness of sounds.
5. Cannot discriminate between similar sounds (pit, pat).
6. Cannot follow simple oral directions.
7. Cannot repeat words or phrases accurately.
8. Avoids cassette stories and lessons.
9. Avoids sounding out words.
10. Cannot make sound-symbol associations.
11. Cannot recognize common sounds (bells, barks, sirens).
12. Cannot block out background sounds.
13. Has difficulty attending to discussions and instructions.

Motor Difficulties

1. Has difficulty copying designs, letters, words.
2. Has difficulty forming letters, with memory of details, and memory of motor movements.
3. Uses poor spacing.
4. Uses inconsistent size and shape.
5. Has orientation problems; right/left, approach to page.
6. Has poorly formed letters; reversals.
7. Holds pencil and/or crayon awkwardly.
8. Bumps into objects.
9. Has jerky, awkward body movements.

Tests Available for Screening

Various tests are available for further identifying specific perceptual deficits that interfere with learning. Each test has a different emphasis and should be used only after the child has demonstrated behaviors that signal the need for perceptual evaluation. The following tests are available to all of the teachers in the remedial program. One or more staff members can provide training in the use of each instrument.

1. Slingerland Screening Tests

Form A (Grades 1 and 2)

Form B (Grades 2 and 3)

Form C (Grades 3 and 4)

Form D (Grades 5 and 6)

Manual - Need complete manual for instructions on scoring; interpretation of errors.

Tests visual discrimination, copying, memory.
 Tests auditory discrimination, memory, sound/symbol
 association.
 Involves visual-motor, auditory-motor tasks.
 Easy to administer. Practice is recommended.

2. Wepman Auditory Discrimination Test

As screening for auditory problems and as basis for
 referring to speech/hearing clinician for further
 analysis. Normed for age.
 Easy to administer and score.

3. Rosner Auditory Analysis

For checking ability to analyze and synthesize sounds;
 also auditory memory.
 Results normed for age.
 Easy to administer and score.

4. Rutgers Drawing Test

For testing visual-motor ability.
 Form A up to age 9.
 Form B for 9 yrs. and above.

5. Keystone Telebinocular

For visual acuity screening.
 This instrument assesses near point/far point vision,
 fusion of eyes, and color vision.
 Evaluator must have prior training.

6. A.I.U. Screening Kit

For identifying learning-disabled students for psychological
 testing. The kit includes:

1. EM Rating Scale
 2. Auditory Disabilities Checklist
 3. Rutgers Drawing Test: Form A, Form B
 4. Auditory Discrimination Test (Wepman)
 5. Auditory Analysis Test (Rosner)
 6. Action Agent Test (for children not yet 7 years old)
 7. Developmental Scale (for children not yet 7 years old)
- Easy to administer. No practice required.

The Slingerland Screening Tests, Wepman Auditory Discrimination Test,
Rosner Auditory Analysis Test and the Rutgers Drawing Test are at each
 teaching site. All are easy to administer but require thoughtful analysis

of the test results. Testing materials contain directions for administering, scoring, and interpreting the test results.

The Keystone Telebinocular Test involves the use of a large viewing device and a series of viewing plates. It can be requested from the program supervisor.

The AIU Screening Kit is used only with children who appear to have severe learning disabilities. The kit requires observations by the child's classroom teacher. Some components may be administered by the remedial teacher. All data are included with the referral for psychological testing.

CHAPTER IV

MODALITY AND INSTRUCTION

Identify the Modality

Modality refers to the stronger sensory input channel as determined by perceptual evaluation. Some children appear to be auditory learners while others appear to be visual learners. The child who has had an evaluation with the WISC or the ITPA has had his modality identified. The Slingerland Screening Test identifies the child's modality or lack of a stronger modality.

Teach to the Modality

Having identified the child's stronger modality and the perceptual deficits which are pre-requisites to reading and arithmetic skill, the remedial teacher can choose instructional strategies that will teach to the child's strengths and/or remediate the deficits. Children with learning difficulties need efficient instruction in a dependable environment. The general instructional strategies are appropriate for remedial small group or individual instruction.

A. General Instructional Strategy

1. Identify a specific instructional goal.
2. Analyze the tasks involved. Present them in sequential order.
3. Structure tasks so there is no chance of failure.

4. Be consistent in the approach used. Do not flip-flop from one approach to another.
5. Be directive. Do not ask the child to perform a task. Tell him that this is what he needs to do to accomplish the goal.
6. Provide immediate feedback on every task.
7. Maintain continuous assessment of child's performance.
8. Use positive methods. Success is a great reinforcer of desired behavior.

B. Strategies that Teach to the Auditory Modality

1. Avoid teaching through sight vocabulary primarily but do not ignore sight vocabulary.
2. Stress phonics, sound-symbol associations, syllabication, structural analysis, word synthesis.
3. Stress context clues.
4. If letter confusion persists, find gimmicks for discrimination.
5. For vowel confusion, teach memory words (at, end, it, on, up).
6. Many look at beginning and guess at word. Look for vowel first, pair it with a consonant, then put beginning sound on. Highlight vowels and endings.
7. Avoid nonsense syllables; he can judge correctness of pronunciation. Use words in child's spoken vocabulary.
8. Teach sounds of vowel teams rather than rules; "When you see oa it says o."
9. Explain terms long and short vowels. Children don't understand this abstract concept. Vowels don't look long or short. Long and short are names for vowel sounds.
10. Word configuration - DLM Sound Foundations.
11. Teach perception of details in pictures. Name details and find similarities and differences in letters and in letter sequence.
12. Orientation - single letter confusion. Manipulatives - sand paper, block letters.

13. Sequencing - picture stories,
 - shape sequences (beads)
 - color sequences
 - letter sequences
 - words
14. If difficulty lies in far point vision, student should be seated close to the board.
15. Teach him to talk through tasks.
16. May need to spell out loud.
17. Needs to say syllables out loud.
18. Have him say (name) punctuation mark as he reads to develop an awareness of its function.
19. Play lots of rhyming and blending games.
20. Allow him to think out loud. Encourage oral response.
21. Tape record lessons and tests. Use records.
22. Pair him with a visual learner. Encourage him to use color cues; markers.
23. Use neurological impress method (child points to words while you read to him. You feed the words into the ear).

C. Adjustments for the Child with Weak Auditory Modality

1. Take out as much noise as possible.
2. Find him a quiet place to work.
3. Very soft music background may be used but not bouncy music.
4. As a teacher, quit talking so much - don't distract him.
5. Use as few words as you can.
6. If you repeat, use the same words.
7. Speak directly to this child.
8. Ear phones and tape recorder help cut out distraction of other noises.
9. Cup your hand about his ear to help him focus on instruction.

D. Strategies that Teach to the Visual Modality

1. Give visual directions.
2. Give demonstrations.
3. Use matching games - Jigsaw matching of words, prefixes, suffixes, etc.
4. Use charts and graphs.
5. Use maps and the use of the legend on the map.
6. Use color coding systems.
7. Use Cuisenaire rods.
8. Use number frames or abacus.
9. Use dictionaries (marking is a code system).
10. Use visual symbols for sound (best to have only one key symbol at first).
11. Use configuration clues.
12. Look for words, letters, in papers and magazines.
13. Use mirror to see mouth.
14. Use visual clues for syllables.
15. Use clues such as green dots as place to begin--red dot to stop when establishing directionality.
16. Allow the child to work with rulers and number lines to develop math concepts.
17. The number balance scale is helpful to these children.
18. If he has difficulty with auditory perception, student should be seated close to instructor. Instructions should be clear, concise, simple, and repeated if necessary. Student should repeat instruction to insure that they were understood.
19. Instructor should stand in front of student and speak at eye level.
20. Do not rely solely on phonetic approach to reading.
21. Outlines and cue words should be written on the board.

E. Adjustments for the Child with Weak Visual Modality

1. Take out visual distractions. It is impossible to take visuals out of the regular classroom but try to place the child where he is not bombarded by too many visual items. (He just swims visually in an overloaded situation).
2. Leave a frame of blank wall around visual displays.
3. On worksheets put a heavy line around items to help pupil to attend to one item at a time. (This can often be done to existing ditto sheets. This does not prevent the use of the worksheet with other children).
4. Give him a BIG marker to help him keep his place.
5. Allow him to point if necessary. Let him touch the first letter of every word.
6. Have him clear the table top (desk top).
7. Let the child get one worksheet at a time from stacks rather than hand the child several papers at once. Also give the child a purpose for moving about a bit as he turns in the completed paper and picks up his next sheet from the next stack.
8. Try not to stand in front of too cluttered background when instructing him. (For some children, it may be necessary for the teacher to wear more simple clothing).
9. Give one step at a time.

CHAPTER V

REMEDIATING PERCEPTUAL DEFICITS

Many of the references written for teachers who work with learning disabled children are oriented to the teacher in a classroom setting. The remedial suggestions listed have been suggested by and for itinerant teachers who work with small groups of children in mobile classrooms (vans) or in temporary facilities. All of the suggestions involve strategies or materials which are accessible in those circumstances. The following suggestions are more specific than those which have been made in preceeding chapters.

Remediation Strategies

A. Specific strategies for strengthening deficits in visual perception.

1. Letter discrimination

- a. Have child match common objects (single pictures, geometric shapes); point out similarities in size, shape, color, etc.
- b. Have child match letters.
- c. Give stimulus letter; have child find several of the same from a box of letters.
- d. Have child circle the stimulus letter as often as it appears in a paragraph.
- e. Use alphabet macaroni to match/sort letters.
- f. Have child find missing parts of common object.
Have child find missing parts of letter.
- g. Play letter Bingo.
- h. Use letter matching worksheets.
- i. Items a-h can be adapted for number discrimination.
- j. Flash-X flash.

2. Letter reversals

- a. Match frequently reversed letters.
- b. Trace frequently reversed letters on sand paper.
- c. Do same activities as in a. above using frequently reversed letters.

- d. Place frequently reversed words on cards for periodic flash review. Use directional arrows for cues if needed.
- e. Use color code on flash card; use red to highlight word beginnings for orientation.
- f. Use matching worksheets.
- g. Word Bingo.
- h. Adapt sight flashcards to game boards.
- i. Items a-h can be adapted for number reversals.

3. Orientation

- a. Place picture or cue at left of page for reading and at right of page for math.
- b. Outline blue lines for writing and math on paper.

4. Sight vocabulary

- a. Language Master.
- b. Dolch Word Bingo games.
- c. Prepare tapes which dictate word (auditory cue) as child follows along on a worksheet with numbered words. The use worksheet without numbers, only words; dictate words saying, "Put 1 beside the word 'jump', 2 beside 'should'," etc.
- d. Prepare worksheet with small groups of words having similar configuration (previous pp. may have very different configuration). On a tape direct the child to circle the word you read.
- e. Play baseball, football, mountain climbing by using sight vocabulary cards for attaining points.
- f. Items a-e can be adapted to math (quick recognition of facts).
- g. Flash-X flash.

5. Structural Analysis

- a. Use color chalk or marker to highlight word parts (roots, prefix, suffix).
- b. Place prefixes on cards. Place roots on cards. Build words.
- c. Use context clues. Omit endings on word in a sentence. Child fills in the missing ending.
- d. Work with compound words.
 - 1. (workbooks, Reading Skills Practice Kit, SRA Schoolhouse).
 - 2. Place words on cards; pair them to make compounds.

6. Visual memory of letters and words

- a. Play memory games with common objects. Present small number of objects, remove, ask child to name objects.
- b. Present uncluttered picture of common object. Give child time to examine, remove, ask child to describe details remembered.
- c. Flash geometric design card, and ask child to match it by choosing from given set of choices.

- d. Present picture with missing parts, ask child to draw in, missing parts.
- e. Ask child to duplicate designs, bead patterns, etc.
- f. Spellout: Present stimulus word. Children draw cards in turn until they get all the letters needed to make the word (Teacher-made cards).
- g. Items a-f can be adapted for number memory.
- h. Flash-X flash.

B. Specific strategies for auditory difficulties

- 1. Stress sight vocabulary and sight recognition of number facts.
- 2. Recognition of visual structural analysis.
- 3. Deal with isolated phonetic elements.
- 4. Use auditory blending of sounds into words.
- 5. Sound-symbol associations.
- 6. Blending of sounds (visual stimulus) into words.
- 7. Teach number facts through cassette tapes.
- 8. Glass Analysis for Decoding (in this handbook).
- 9. Auditory Analysis Training (in this handbook).

C. Specific strategies for strengthening deficits in math related disabilities

- 1. For visual difficulties, use graph paper, highlight right hand column, etc.
- 2. For right and left confusion, put shape or picture in right corner of paper.
- 3. Use body movement as often as possible. Example: In large clock, each person is a number. Use a rope to shape a number and walk or draw along rope.
- 4. Use graphs to record own progress.
- 5. Music Tempo - For fast drill exercise use music at fast tempo.
- 6. For auditory reinforcement, use oral dictation of numbers.
- 7. Copying tasks - stress accuracy.
- 8. Highlight calendar with special pictures (pumpkins, frogs, sleds, etc.) so that students will attend to the calendar without specific instructions.

9. For teaching change, relate dollars to pennies (one dollar is 100 pennies).
 10. Relate operations to money concepts.
 11. Bring abstract concepts to the concrete. Break skills into basic component skills.
 12. Use milk carton computers for number fact mastery. Flash card is inserted and slides through a slot showing the answer as it comes out. Teacher-made.
 13. Card games.
 14. Use of manipulatives (DLM, Dolch, geoboards, etc.)
- D. Level of presentation of math concepts:
- Concepts that lend themselves to physical representation can be taught using the following sequence of presentation:
1. Concrete objects or forms that can be manipulated by the students.
 2. Pictures representing objects within the experience learner's.
 3. Geometric shapes or forms.
 4. Symbols, such as letters, numerals, and words, are the highest level of presentation.

The Guide to Perceptual Remediation

The Guide to Perceptual Remediation on the next four pages recapitulates much of what has already been presented. The chart orders the information in a perceptually efficient form. The first column defines an area of perceptual weakness. The second column suggests techniques to remediate the deficit or to permit the child to compensate for the deficit. The last column suggests specific materials or activities.

GUIDE TO PERCEPTUAL REMEDIATION

VISUAL PERCEPTION

AREA OF WEAKNESS	TEACHING TECHNIQUES TO REMEDIATE OR COMPENSATE	MATERIALS AND/OR ACTIVITIES
VISUAL PERCEPTION - the identification, organization and interpretation of sensory data received by the individual through the eye.	Pair auditory work with visual work for a student very deficient in visual skills. Slow readers may learn content much quicker through auditory input, and should not be penalized for poor reading skills. In testing a child with visual weaknesses, auditory tests should be considered as an alternative method.	Tape recorded lessons, Tests Language Master Activities Records Readers Digest Books with Tapes Student Helpers to read to or listen to and help student with visual problems. Let student read aloud to himself.
<u>Visual Attention</u> the ability to attend and focus on visual stimuli	Cut down on extraneous visual stimuli by structuring visual input or using clue or key word to get attention, "Look".	Screens, Masks, Pointers, Under- liners, etc. Tachistoscopes, Controlled Readers
<u>Visual Discrimination</u> the ability to differentiate visual stimuli	Teach similarities and differences of visual forms. Teach categorizing by visual elements. Present two items in vertical form for comparison (such as spelling words, number sequences, scientific notation).	Word match games Circle or underline similar and different elements for emphasis Bar graphs Proofreading
<u>Visual Figure-Ground</u> the ability to attend to one aspect of the visual field and perceive it in relation to the background without having the background interfere	Use highly structured visual material - large print, well-spaced. Student can use screen, mask, or pointer for focusing on figure. Gradually, present the student with more background.	Finding hidden pictures, numbers Word search games, What's missing games Maps

VISUAL PERCEPTION

AREA OF WEAKNESS	TEACHING TECHNIQUES TO REMEDIATE OR COMPENSATE	MATERIALS AND/OR ACTIVITIES
<u>Visual Analysis and Synthesis</u> the ability to take apart and put together or organize and visualize information received through the eye	Teach student visually and/or manually to take apart and put together things such as words into syllables, math computation into steps	Jigsaw puzzles, Mazes, Anagrams Spill and Spell, Scrabble, Crossword Puzzles, Coded Puzzles Scrambled Words, Sentences, Dates
<u>Visual Memory</u> the ability to store and retrieve information presented visually when the original stimulus is no longer present	Use configuration boxes, underlining, colored sections for emphasis. Exaggerated forms or examples help students to re-visualize more readily than ordinary examples. If visual memory is very weak, present memory work in auditory form as on a tape recorder.	Flash cards Descriptions of what student saw in composition or verbal form. Teach useful adjectives and ways to describe what was seen. Mnemonic Devices, Association clues <u>The Memory Book</u> by Lorayne and Lucas
<u>Visual Sequence</u> the ability to remember in order what was seen	Have student talk through sequence if auditory skills are stronger. Student can physically manipulate cut-up sentences, letters, numbers to achieve proper order. Teacher can use numbers, order words, and teach cause and effect	Flow charts, Date lines, Outlining Alphabetical Order (Phonebook) Number Line Sequences Scrambled words, sentences, paragraphs.

AUDITORY PERCEPTION

AREA OF WEAKNESS	TEACHING TECHNIQUES TO REMEDIATE OR COMPENSATE	MATERIALS AND/OR ACTIVITIES
AUDITORY PERCEPTION - the ability to identify, organize and interpret the sensory data received by the individual through the ear	Teach student through auditory input at a slower rate in short, clear sentences. Teach student to use visual clues such as gestures, facial expressions, charts, note taking for compensa- tion. Switch to a visual task when the student appears fatigued. Living in an auditory world, this student is already over-taxed and missing a lot - give him alternatives. Let him work individually in a visual program if necessary.	Language Master, Records, and Tape recorders where student can control rate, and listen again when needed. Blackboard Outlines, key words, Notes, Drawings, Filmstrips, Charts Written Outlines or Guides for Auditory Material S.R.A. Individual Program Lab and similar kits.
<u>Auditory Attention</u> the ability to attend and focus on auditory stimuli	Give clue, gesture or key word such as "Listen" or "listen for. . ." to get student's attention. Keep auditory input clear, simple and in short sentences. Then try gradually to build attention span. Begin slowly.	Music, Tapes, Topics of Interest, Radio. Pair with visual aids to compensate. When speaking, be animated, keep voice interesting rather than monotone.
<u>Auditory Discrimination</u> the ability to differentiate auditory stimuli	Give pairs of words or sentences and student listens for similarities and differences. Emphasize on parts that may be different. Enunciate very clearly.	Beginning, Middle, Ending Syllable Poems with Rhymes

AUDITORY PERCEPTION

AREA OF WEAKNESS	TEACHING TECHNIQUES TO REMEDIATE OR COMPENSATE	MATERIALS AND/OR ACTIVITIES
<u>Auditory Figure-Ground</u> the ability to attend to one aspect of the auditory field without the background interfering	Try to reduce background noise as much as possible. Place student in front of room in a quiet location, not by the door. If student is highly distractible, a study carrol might be advisable.	Use tapes for lessons where back-ground noise is gradually introduced and increased. Have student listen for a specific part of a sentence such as an absurdity or an adjective.
<u>Auditory Analysis & Synthesis</u> the ability to take apart and put together or organize information received through the ear	Teach student to identify parts in what he hears and then put them together in a meaningful way. Give help in directing his attention by telling him the part to listen for.	Spelling words taught by syllables. Listening to auditory information and retell in his own words. Give parts, student blends to form words.
<u>Auditory Memory</u> the ability to store and retrieve information presented auditorally	Emphasize important words or parts to be remembered. Teach student to visualize while trying to memorize. Teach recognition and partial recall, as in multiple choice first before expecting total recall. Use visual channel for memory when auditory is too weak.	Verbal Games - I'm going on a trip Mnemonic Devices, Association Clues <u>The Memory Book</u> by Lorayne and Lucas Notetaking, Language Master

The Matrix of Perceptual Treatments

The Matrix of Perceptual Treatments on pages lists the instructional materials that are used in the remedial program. They are listed in alphabetical order. The materials are identified according to type of teaching material; reading, arithmetic, visual, auditory, or multisensory. All fourteen objectives are listed on the matrix. The X's in the cells identify the materials according to type of material and according to appropriateness for remediating perceptual skills.

The user can read across any line to plan how to use a material. ASMD Worksheets are arithmetic materials which can be used to teach a visual learner. They can be used to improve visual discrimination, visual orientation, visual figure-ground, visual attention, and visual motor (handwriting) skills. If oral directions are given, they are also appropriate for improving auditory memory and auditory attention.

If a teacher wants to ameliorate a deficit in auditory memory (A-6) he or she reads down the column. Each X identifies a material which is appropriate for remediating that skill.

Steps for Remediating a Perceptual Deficit

1. Select no more than two or three perceptual skills for treatment.
2. Determine the order of difficulty or complexity.
3. Write them into the child's IIP.
4. Compare the materials listed on the child's Objectives and Materials (O&M) form with those on the Matrix of Treatment.
5. Write the code number of the perception objective beside the appropriate material on the O&M forms.

MATRIX OF PERCEPTUAL TREATMENTS

INSTRUCTIONAL MATERIALS IN THE REMEDIAL PROGRAM	TYPE OF TEACHING MATERIAL					TYPE OF PERCEPTUAL REMEDATION													
	Reading	Arithmetic	Visual	Auditory	Multisensory	V-1 Visual Discrimination	V-2 Visual Orientation	V-3 Visual Sequence	V-4 Visual Figure-Ground	V-5 Visual Memory	V-6 Visual Attention	V-7 Visual Motor-Handwriting	A-1 Auditory Discrimination	A-2 Auditory Synthesis	A-3 Auditory Analysis	A-4 Auditory Figure-Ground	A-5 Auditory Sequence	A-6 Auditory Memory	A-7 Auditory Attention
Alphabetical Order	x				x		x										x		
ASMD Worksheets		x	x			x	x		x		x	x						x	x
Arithmetic Fact Kit, SRA		x	x			x	x		x		x	x							
Auditory Analysis-Synthesis Program	x			x									x	x	x	x	x	x	x
Bingo, Word or Number	x	x			x	x	x	x	x	x	x		x			x		x	x
Bowmar Math Sheets		x	x			x	x	x	x	x	x	x						x	x
Chalkboard (lap size)	x	x	x				x	x		x	x	x							
Classmate 88		x	x			x	x	x		x	x	x							
Clues, EPC	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Comprehension Bubble, SRA	x				x	x	x	x	x	x	x	x				x	x	x	x
Computapes, SRA		x			x	x	x	x	x	x	x	x				x	x	x	x
Controlled Reader	x		x			x	x	x	x	x	x								
Crossnumber Puzzles		x	x			x	x	x	x	x	x	x							
Crossword Puzzles	x		x			x	x	x	x	x	x	x							
Cuisenaire Rods		x			x	x	x	x	x	x	x								
Dataman		x	x			x	x	x	x	x	x	x							
Dictation	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
DIM Materials	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Factpacer Device, SRA		x	x			x	x	x	x	x	x	x							
Flashcards	x	x	x			x	x			x	x								
Flash-X Device, EDL	x	x	x			x	x	x	x	x	x	x							
Flowchart	x		x			x	x	x	x	x	x	x							
Glass-Analysis Decoding	x				x	x	x	x	x	x	x		x	x	x	x	x	x	x
ICSP Math		x	x			x	x	x	x	x	x	x							
ICT Guided Reading	x				x	x	x	x	x	x	x	x				x	x	x	x
Language Master	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

INSTRUCTIONAL MATERIALS IN THE REMEDIAL PROGRAM	TYPE OF TEACHING MATERIAL					TYPE OF PERCEPTUAL REMEDATION													
	Reading	Arithmetic	Visual	Auditory	Multisensory	A-1 Visual Discrimination	A-2 Visual Orientation	V-3 Visual Sequence	V-4 Visual Figure-Ground	V-5 Visual Memory	V-6 Visual Attention	V-7 Visual Motor, Handwriting	A-1 Auditory Discrimination	A-2 Auditory Synthesis	A-3 Auditory Analysis	A-4 Auditory Figure-Ground	A-5 Auditory Sequence	A-6 Auditory Memory	A-7 Auditory Attention
Listening Skill Builder	x			x									x			x	x	x	x
Map Study Skills	x		x			x	x		x		x	x							
Math-A-Dot		x	x			x	x	x	x	x	x	x							
Mathematics Drillpak, SRA		x	x			x	x	x	x	x	x	x							
Math MiniSystems, Coronet		x			x	x	x	x	x	x	x	x	x			x	x	x	x
McCall Crabbs Test Lesson	x		x			x	x	x	x	x	x								
Merrill Skill Tapes		x			x	x	x	x	x	x	x	x	x			x	x	x	x
Michigan Tracking	x	x	x			x	x	x	x	x	x	x	x						
Number Line		x	x			x	x	x	x	x	x	x							
Phonics Bubble, SRA	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Read-Along Books	x				x	x	x	x	x	x	x		x			x	x	x	x
Reader's Digest Tutors	x				x	x	x	x	x	x	x	x				x	x	x	x
Reading for Understanding	x		x			x	x	x	x	x	x	x							
Scholastic Math Program		x		x		x	x	x	x	x	x	x	x			x	x	x	x
Schoolhouse Comprehension	x		x			x	x	x	x	x	x	x							
Schoolhouse Mathematics		x	x			x	x	x	x	x	x	x							
Schoolhouse Word Attack	x		x			x	x	x	x	x	x	x							
Scope Visuals	x		x			x	x	x	x	x	x	x							
Scrambled Sentences	x		x			x	x	x	x	x	x	x							
Skill through Patterns		x	x			x	x	x	x	x	x	x							
Spill and Spell	x				x	x	x	x	x	x	x		x	x	x	x	x	x	x
Structural Analy. Bubble	x				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
System 80	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

6. When the child performs that task tell him that it is improving the perceptual skill as well as the math skill.
7. Use one-fifth of each instructional period to practice the targeted perceptual skill. Remediate only one at a time.
8. Give the child immediate feedback or reinforcement for the desired behavior.

Teach new reading or math skills with materials that match the child's perceptual modality. Remediate perceptual deficits with practice materials. After a child has learned the math skill he practices it. It is this practice that is used to remediate deficit area. For example, the auditory learner may learn his multiplication facts auditorily. Needing to develop skill in visual figure-ground discrimination, he uses his learned multiplication facts in a paper and pencil exercise which he has been told will give him practice in using his multiplication and will also improve his ability to attend to that math problem while screening out the others (visual figure-ground). If perceptual training is to be effective, the child must know why he is performing the task.

Remediation and Self-Fulfilling Prophecy

Why tell the student that his math or reading tasks will improve perceptual deficits? Studies by Brophy and Good,⁸ Palardy,⁹ Rist,¹⁰ and

⁸J. E. Brophy and T. L. Good, "Teachers' Communication of Differential Expectations for Children's Classroom Performance: Some Behavioral Data," Journal of Educational Psychology 61 (1970) 365-374 (Quote from pp. 365-66.)

⁹J. M. Palardy, "What Teachers Believe--What Children Achieve," Elementary School Journal 69 (1969), pp. 370-374.

¹⁰R. C. Rist, "Student Social Class and Teacher Expectations: The Self-Fulfilling Prophecy in Ghetto Education," Harvard Educational Review 40 (1970), pp. 411-451.

Rosenthal and Jacobson,¹¹ document the impact of teachers' expectations upon students' achievement. Studies in which there has been an analysis of interactions between teachers and individual pupils have provided a number of findings supporting the belief that self-fulfilling prophecies occur.

Brophy and Good (1970) suggest that expectation effects follow a sequence, making a chain of behaviors, as follows:¹²

- A. The teacher forms differential expectations for student performance.
- B. He then begins to treat children differently in accordance with his differential expectations.
- C. The children respond differentially to the teacher because they are being treated differently by him.
- D. In responding to the teacher, each child tends to exhibit behavior which complements and reinforces the teacher's expectations for him.
- E. As a result, the general academic performance of some children will be enhanced while that of others will be depressed, with changes being in the direction of teacher expectations.
- F. These effects will show up in the achievement tests given at the end of the year, providing support for the "self-fulfilling prophecy" notion.

¹¹R. Rosenthal and L. Jacobson, Pygmalion in the Classroom: Teacher Expectation and Pupils' Intellectual Development (New York: Holt, Rinehart and Winston, 1968).

¹²Brophy and Good, pp. 365, 366.

CHAPTER VI

WRITING THE PERCEPTION IIP

Guidelines for Writing an IIP

The guidelines for writing a perception IIP are similar to the guidelines for writing a reading or an arithmetic program. The underlined words below refer to parts of the IIP form.

1. Instructional Area refers to instruction in perceptual skills. Write perception in the blank space.
2. Student's Name and School Years should be filled in with the child's name and the school year during which instruction will be delivered.
3. Annual Goals are the fourteen objectives which have been listed for inclusion in the program. Write the goal as a terminal behavior as shown in chapter 2.
4. Short Term Objectives are the specific tasks that tell what the child will do to achieve the annual goal.
5. Evaluation Procedures/Conditions describe how you will measure what the child can do. Included are the conditions under which the learning will be evaluated. Conditions may include any one or all of the following:
 - time
 - allowances
 - restrictions
6. Success Criteria describe how well we expect the student to perform the skill. Criteria may be stated as percent or number correct, a time limit, or other qualitative descriptors.
7. Progress is noted as each educational task is accomplished. Using the following criteria, indicate the degree of accomplishment:
 1. Accomplished (Include date)
 2. In Process
 3. Not Introduced
 4. Not Appropriate

8. AIU Teacher signs each instructional program.
9. A child's IIP may consist of one or more pages, but no more than two or three perceptual objectives need be treated in a given semester.
10. Each program should be reviewed with the child's classroom teacher or the principal as soon after writing as is feasible and again at the end of the school year.
11. White, Yellow, and Pink copies are separated. The white copy is given to the principal who may pass it on to the classroom teacher. The yellow copy is the AIU teacher's working copy and eventually becomes part of the student's AIU file. It should be available for review by the supervisor of remedial services upon request. The pink copy is given to the parent with appropriate explanation during a parent conference.
12. Prior to the final parent conference, or when most of the remedial tasks have been accomplished, the AIU teacher will review the program with the original reviewer. A new program may be written for the student on the basis of identified needs. It is conceivable that some children will not have accomplished all tasks by the end of the school year. Others, on the other hand, may require more than one program.

A sample of a perception IIP is included on the next page.

Instructional Area Perception

Student's Name Charlie

School Year 1978-1979

V-5 Annual Goal Visual Memory - Given a brief exposure to a visual stimulus of 2, 3, 4, or 5 letter words or 2, 3, 4, or 5 digit numbers, the student will write the form with reasonable accuracy.

Short-Term Objectives

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
Flash two-digit number on flashcard	Practice, Shuffle, Test Set of 10 flashcards 1-second exposure	Practice, Shuffle, Test 10 of 10 right on test	Accomplished 10/2
Flash three-digit number on flashcard	1-second exposure	10 of 10 right on test	Accomplished 12/5
Flash four-digit number of flashcard	1 1/2-second exposure	10 of 10 right - may repeat test once	Accomplished 2/7
Flash five-digit number of flashcard	2-second exposure	10 of 10 right - may repeat test twice	In Process 333

A-5 Annual Goal Auditory Sequencing - Given a sequence of auditory stimuli, the student will make the appropriate verbal or written response.

Short-Term Objectives

Educational Tasks	Evaluation Procedures/Conditions	Success Criteria	Progress
Dictate 2-digit numbers for subtraction	Put on tape - May replay	10 of 10 problems written correctly.	Accomplished 11/9
Teacher dictates 2 digit numbers for subtraction	Teacher repeats once	9 of 10 problems written correctly.	Accomplished 12/14
Teacher dictates 2 digit numbers for subtraction	Teacher repeats once	10 of 10 problems written correctly	Accomplished 1/17
Dictate 3-digit numbers for subtraction	Put on tape - May replay	10 of 10 problems written correctly	Accomplished 3/15
Teacher dictates 3-digit numbers for subtraction	Teacher repeats once	9 of 10 problems written correctly	In Process
Teacher dictates 3-digit numbers for subtraction	Teacher repeats once	10 of 10 problems written correctly.	

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GLOSSARY

Acalculia A loss of the ability to manipulate arithmetic symbols and to perform simple mathematical calculations.

Alexia Loss of the ability to read written or printed language.

Amnesia Lack or loss of memory.

Asphasia Loss of the ability to comprehend, manipulate, or express words in speech, writing, or signs. Usually associated with injury or disease in brain centers controlling such processes.
Auditory asphasia: Inability to formulate spoken words; same as word deafness and receptive asphasia.
Formulation asphasia: Inability to formulate sentences properly. Confusion occurs in relationships and tenses rather than in words themselves (E.G., Betty give I flowers).

Auditing Listening, hearing recognizing, interpreting, and responding to spoken language.

Audiometer A hearing screening device, either a pure-tone audiometer or or a speech threshold audiometer.

Auditory association Ability to relate concepts presented orally.

Auditory closure Ability to recognize the whole from the presentation of a partial auditory stimulus.

Auditory discrimination Ability to distinguish auditorily between slight differences in sounds.

Auditory memory Ability to recall words, digits, etc., in a meaningful manner; includes memory of meaning.

Auditory perception Ability to receive sounds accurately and to understand what they mean.

Auditory reception Ability to derive meaning from orally presented material.

Auditory sequential memory Ability to reproduce a sequence of auditory stimuli.

Blend Combining of two letters into a sound in which each retains its distinctive sound.

Body image Awareness of one's own body and its orientation, position, and movement in space and time.

Cerebral dominance Assumption that one cerebral hemisphere generally leads the other in control of bodily movements. In most individuals, the left side of the brain controls language and is considered the dominant hemisphere.

Channels of communication The sensory-motor pathways through which language is transmitted, e.g., auditory-vocal, visual-motor, among other possible combinations.

Chronological age Refers to the number of years a person has lived.

Closure Ability to recognize a whole or Gestalt, especially when one or more parts of the whole are missing or when the continuity is interrupted by gaps.

Conceptualization Ability to infer from what is observable.

Congenital Present at birth; usually a defect of either familial or exogenous origin which exists at the time of birth.

Conservation In Piaget's theory, the ability to retain a concept of area, mass, length, etc., when superficial changes are made in the appearance of an object or scene.

Decoding The receptive habits in the language process, e.g., sensory acuity, awareness, discrimination, and vocabulary comprehension.

Directionality Awareness of laterality (the two sides of the body) and vertically (vertical axis awareness), as well as the ability to translate this discrimination within the organism to similar discrimination among objects in space.

Discrimination The process of detecting differences between and/or among stimuli.

Auditory: Identification of likeness and differences between sounds.

Visual: Ability to recognize differences between similar but slightly different forms or shapes as in alphabetic letters.

Distractability The tendency to be drawn away easily from any task at hand and to focus on extraneous stimulus of the moment.

Dyscalculia Partial loss of the ability to calculate, to manipulate number symbols, or to do simple calculations.

Dysgraphia Partial inability to express ideas by means of writing or written symbols; usually associated with brain dysfunction.

Dyslexia Partial inability to read, or to understand what one reads silently or aloud. Condition is usually, but not always, associated with brain impairment. (Some authors refer to genetic dyslexia, affective dyslexia, experiential dyslexia, congenital dyslexia, etc.)

Dysphasia Partial inability to comprehend the spoken word (receptive dysphasia) and to speak (expressive dysphasia) which is believed to be the result of injury, disease, or maldevelopment of the brain.

Echolalia Meaningless "echoing" or repetition, of words, or sometimes of sounds.

Emotional blocking Inability to think or make satisfactory responses due to excessive emotion, usually related to fear.

Emotional lability Tendency toward cyclic emotional behavior characterized by sudden unexplainable shifts from one emotion or another.

Encoding The expressive habits in the language process, i.e., response formation including word selection, syntax, grammar, and the actual motor production of the response.

Etiology The cause or origin of a condition.

Expressive language skills Skills required to produce language for communication with other individuals. Speaking and writing are expressive language skills.

Feedback The sensory or perceptual report of the result of a somatic, social, or cognitive behavior.

Figure-ground Tendency of one part of a perceptual configuration to stand out clearly while the remainder forms a background.

Figure-ground disturbance Inability to discriminate a figure from its background.

Gestalt A term used to express any unified whole whose properties cannot be derived by adding the parts and their relationships; an entity which is more than the sum of its parts.

Global Perceived as a whole without attempt to distinguish separate parts or functions.

Grammatical closure Ability to make use of the redundancies of oral language in acquiring automatic habits for handling syntax and grammatical inflections.

Handedness Refers to hand preference of an individual.

Hand-eye coordination Ability of the hand and eye to perform easily together.

Hard neurological signs Physical symptoms of brain injury which can be identified medically.

Hemispherical dominance Refers to the fact that one cerebral hemisphere generally leads the other in control of body movement, resulting in the preferred use of left or right (laterality).

Hyperactivity Constant and excessive movement and motor activity.

Hypoactivity Insufficient motor activity characterized by lethargy.

Imagery Representation of images.

Impulsivity Initiation of sudden action without sufficient forethought or prudence.

Inner language The process of internalizing and organizing experiences without the use of linguistic symbols.

Itinerant teacher A teacher who moves about a school district to several schools and schedules children for teaching periods; children leave their regular classrooms to work with such a teacher.

Kinesthetic The sense by which muscular motion, position, or weight are perceived; thought of as being in muscles and joints.

Laterality The internal awareness of the two sides of one's body. A sense of sidedness which includes the tendency to use one hand for specific tasks.

Memory The ability to store and retrieve upon demand previously experienced sensations and perceptions, even when the stimulus that originally evoked them is no longer present; also referred to as "imagery" and recall.

Memory span The number of related or unrelated items that can be recalled immediately after presentation.

Mental age The level of mental ability.

Mixed laterality or lateral confusion Tendency to perform some acts with a right side preference and others with a left, or the shifting from right to left for certain activities.

Modality The pathways through which an individual receives information and thereby learns. The "modality concept" postulates that some individuals learn better through one modality than through another. For example, a child may receive data better through the visual modality than through his auditory modality.

Ophthalmologist A vision specialist with an M.D. degree, licensed to prescribe refractions and to treat eye diseases.

Optometrist A vision specialist with an O.D. degree, licensed to prescribe refractions and to treat the functional aspects of vision, but not permitted to use drugs or treat eye diseases.

Perception The process of organizing or interpreting the raw data obtained through the senses.

Perceptual constancy Ability to accurately perceive the invariant properties of objects--such as shape, position, size, etc.--in spite of the variability of the impression these objects make on the senses of the observer.

Perceptual disorder A disturbance in the awareness of objects, relations, or qualities, involving the interpretation of sensory stimulation.

Perceptually handicapped A term applied to the person who has difficulty in learning because of disturbance in his perception of sensory stimuli.

Perceptual-motor A term describing the interaction of the various channels of perception with motor activity. The channels of perception include visual, auditory, tactual, and kinesthetic.

Perceptual-motor match The process of comparing and collating the input data received through the motor system and the input data received through perception.

Perseveration The tendency for a specific act of behavior to continue after it is no longer appropriate; related to difficulty in shifting from one task to another.

Phoneme The smallest unit of sound in any particular language.

Psychoeducational diagnostician A specialist who diagnoses and evaluates a child who is having difficulty in learning. A variety of psychological and educational testing instruments are used.

Psycholinguistics The field of study that blends aspects of two disciplines--psychology and linguistics--to examine the total picture of the language process.

Psychomotor Pertaining to the motor effects of psychological processes. Psychomotor tests are tests of motor skill which depend upon sensory or perceptual motor coordination.

Reauditorization Ability to recall the name or sounds of visual symbols (letters). Some individuals remember what letters look like but not which sound they make.

Receptive language Language that is spoken or written by others and received by the individual. The receptive language skills are listening and reading.

Resource teacher A specialist who works with children with learning disabilities and acts as a consultant to other teachers, providing materials and methods to help children who are having difficulty within the regular classroom. The resource teacher may work from a centralized resource room within a school where appropriate materials are housed.

Reversal A transposition of letters.

Revisualization Ability to retrieve a visual image of a letter or word that is heard from one's memory so that it can be written.

Right-left disorientation Inability to distinguish right from left; having no awareness of directionality.

Rigidity Maintaining an attitude or behavioral set when it is no longer appropriate.

Rotations The turning around of letters in a word; for example, "p" for "d".

Sensorimotor A term applied to the combination of the input of sense organs and the output of motor activity. The motor activity reflects what is happening to the sensory organs such as the visual, auditory, tactual, and kinesthetic sensations.

Sequential development A step-by-step plan of development wherein one skill is built upon another.

Soft neurological signs Behavioral symptoms that suggest possible minimal brain injury in the absence of gross or obvious neurological abnormalities.

Sound blending Ability to synthesize the separate parts of a word and product an integrated whole.

Specific language disability A term usually applied to those who find it very difficult to learn to read and spell, but who are otherwise intelligent, and usually learn arithmetic readily. More recently, this term has been applied to any language deficit--oral, visual, or auditory.

Spatial orientation Awareness of space around the person in terms of distance, form, direction, and position.

Splinter skills Highly specific isolated physical skills which develop to satisfy academic demands which lie beyond a child's regular skill development.

Strauss syndrome The cluster of symptoms characterizing the "brain-injured" child; includes hyperactivity, distractability, and impulsivity.

Strephosymbolia Reversal in perception of left-right order especially in letter or word order; "twisted symbols."

Syllabication A word-attack skill consisting of breaking a word down into its appropriate syllables.

Syndrome The cluster or pattern of symptoms which characterizes a specific disorder.

Syntax . That part of a grammatical system which deals with the arrangement of word forms to show their mutual relations in the sentence.

Tactile Pertaining to the sense of touch, also tactual.

Tactile perception Ability to interpret and give meaning to sensory stimuli that are experienced through the sense of touch.

Verbal expression Ability to express one's concepts verbally.

Vertical Pertaining to the axis from head to foot of the human body.

Vision screening A sampling of visual skills for the purpose of finding visual problems.

Visual acuity Refers to the sharpness of vision.

Visual association The organizing process by which one is able to relate concepts presented visually.

Visual closure Ability to identify a visual stimulus from an incomplete visual presentation.

Visual discrimination Ability to discern visually similarities and differences.

Visual fusion Coordination of the separate images in the two eyes into one image.

Visual-motor Ability to relate visual stimuli to motor responses in an appropriate way.

Visual-motor coordination Ability to coordinate vision with the movements of the body or parts of the body.

Visual perception The identification, organization, and interpretation of sensory data received by the individual through the eyes.

Visual reception Ability to gain meaning from visual symbols.

Visual sequential memory Ability to reproduce sequences of visual items from memory.

Word-attack skills Ability to analyze unfamiliar words by syllables and phonic elements and to arrive at their pronunciation.

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APPENDIX

TEACHER RESOURCES

Teachers will find many instructional activities in the following resources. While there are many teachers' resources, these five address perceptual modality and deficits as well as instruction in the skill areas. All are available from the Remedial Services professional library.

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